

## DOCTOR OF PHILOSOPHY

### Private savings, financial developments and institutions in emerging economies

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# Private Savings, Financial Development and Institutions in Emerging Economies

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By

FAUZI ZAINIR

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Submitted in partial fulfilment of the University's requirements for the  
Degree of Doctor of Philosophy



The work contained within this document has been submitted by the student in partial  
fulfilment of the requirement of their course and award

## TABLE OF CONTENTS

LIST OF TABLES	viii
LIST OF FIGURES	x
LIST OF EXHIBITS	xi
ABSTRACT	xxii
LIST OF ABBREVIATION USED	xxiii
ACKNOWLEDGEMENT	xxiii

### CHAPTER 1 INTRODUCTION

1.1	Introduction .....	1
1.2	EMERGING ECONOMIES.....	5
1.3	MOTIVATION OF STUDY.....	7
1.4	RESEARCH AIMS AND HYPOTHESIS.....	8
1.4.1	Objectives.....	8
1.4.2	Hypothesis.....	9
1.5	STRUCTURE OF EACH CHAPTER.....	9

### Chapter 2 THEORIES and LITERATURE REVIEWS on SAVINGS AND GROWTH

2.1	INTRODUCTION.....	12
2.2	SAVINGS THEORIES AND EMPIRICAL EVIDENCE	
2.2.1	Micro Oriented theory of Savings - Consumer Optimization Model .....	14
2.2.2	Macro Oriented Theory of Savings	
2.2.2.1	Permanent Income Hypothesis (PIH).....	18
2.2.2.2	Life Cycle Hypothesis (LCH).....	21
2.2.3	REVIEW OF EVIDENCE ON SAVINGS.....	25
2.2.3.1	Demography Effect.....	25

2.2.3.2	Growth Effect.....	28
2.2.3.3	Government Savings Effect .....	31
2.2.3.4	Real Interest Rate Effect.....	33
2.3.3.5	Inflation Effect.....	35
2.3.3.6	Terms of Trade Effect.....	36
2.3.3.7	Financial Development Effect.....	37
2.3	GROWTH THEORIES AND EVIDENCE	
2.3.1	Neo Classical Growth - Solow-Swan Model .....	39
2.3.2	Growth and Financial Development.....	46
2.3.2.1	Financial Development Model.....	46
2.3.2.2	McKinnon-Shaw Financial Liberalisation Model.....	50
2.3.2.3	Empirical evidence on Financial Development and Growth .....	52
2.3.3	Growth and Institutions.....	58
2.3.3.1	Law and Finance Hypothesis.....	60
2.3.3.2	Endowment Hypothesis.....	62
2.3.3.3	Political Process Hypothesis.....	63
2.3.3.4	Empirical evidence on Institutions and Growth.....	65
2.3.3.4.1	Level of Democracy.....	69
2.3.3.4.2	Property Rights.....	71
2.3.3.4.3	Rule of Law .....	72
2.3.3.4.4	Corruption.....	74
2.4	RATIONALISING THE IMPORTANCE OF PREVIOUS STUDIES FOR CURRENT RESEARCH.....	75
2.5	HYPOTHESES ON SAVINGS -INSTITUTIONS AND FINANCIAL DEVELOPMENT-GROWTH NEXUS.....	77
2.5	CONCLUSION.....	79

## CHAPTER 3 TREND AND DESCRIPTIVE ANALYSIS ON 20 EMERGING ECONOMIES

3.1	INTRODUCTION.....	82
3.2	LATIN AMERICAN REGION	
3.2.1	Argentina.....	83
3.2.2	Brazil.....	87
3.2.3	Mexico.....	89
3.2.4	Chile.....	90
3.2.5	Venezuela.....	92
3.2.6	Colombia.....	93
3.3	MIDDLE EAST & NORTH AMERICAN REGION (MENA) AND PROXIMITIES	
3.3.1	Saudi Arabia.....	95
3.3.2	Egypt.....	96
3.3.3	Turkey.....	98
3.3.4	Israel.....	100
3.3.5	Morocco.....	103
3.3.6	Tunisia.....	105
3.3.7	South Africa.....	106
3.4	ASIA PACIFIC REGION	
3.4.1	India.....	107
3.4.2	South Korea.....	110
3.4.3	Philippines.....	113
3.4.4	Indonesia.....	114
3.4.5	Thailand.....	116
3.4.6	Malaysia.....	117

3.4.7	Singapore.....	119
3.5	SAVINGS DETERMINANTS BY REGION	
3.5.1	Private Savings.....	122
3.5.2	GDP Per Capita Income Growth.....	125
3.5.3	Credit to Private Sectors.....	127
3.5.4	Inflation.....	130
3.5.5	Real Deposit Interest Rate.....	132
3.5.6	Youth Dependency Population.....	134
3.5.7	Old Dependency Population.....	136
3.5.8	Urban Growth.....	137
3.6	WITHIN REGION COMPARISON: SAVINGS and Other Variables	
3.6.1	Latin American Region.....	140
3.6.2	MENA Region.....	141
3.6.3	Asia Pacific Region.....	142
3.7	CONCLUSION.....	143

## **CHAPTER 4 PRIVATE SAVINGS AND DETERMINANTS**

4.1	INTRODUCTION.....	145
4.2	METHODOLOGY AND DATA DESCRIPTION	
	Methodology .....	146
	Data Description.....	151
4.3	CORRELATION.....	154
4.4	EMPIRICAL	
4.4.1	Main Findings.....	156

4.4.2	Robust Test	
4.4.2.1	Asia Pacific Region.....	164
4.4.2.2	Middle East and North American Region (MENA).....	169
4.4.2.3	Latin America Region.....	173
4.5	CONCLUSION.....	177

## CHAPTER 5 FINANCIAL DEVELOPMENT AND GROWTH

5.1	INTRODUCTION.....	180
5.2	METHODOLOGY AND DATA DESCRIPTION.....	180
5.2.1	Unit Root Test.....	181
5.2.2	Vector Autoregressive Method (VAR) .....	184
5.2.3	Cointegration Method.....	185
5.2.3.1	Pedroni Cointegration Method.....	186
5.2.3.2	Cointegration Method.....	187
5.2.4	Error Correction Method .....	189
5.3	EMPIRICAL FINDINGS	
5.3.1	Short Run Causality.....	192
5.3.2	Long Run Causality: Cointegration and Error Correction Method.....	199
5.3.2.1	Unit Root Test.....	199
5.3.2.2	Pedroni Cointegration.....	201
5.3.2.3	Johansen Cointegration and Error Correction Method.....	202
5.4	CONCLUSION.....	210

## **CHAPTER 6            PRIVATE SAVINGS AND NON-MARKET INSTITUTIONAL FACTORS**

6.1	INTRODUCTION.....	212
6.2	METHODOLOGY AND DATA DESCRIPTION	
6.2.1	Data Description.....	213
6.2.2	Methodology.....	216
6.2.2.1	Fixed Effect Method.....	218
6.2.2.2	Hausman Method.....	219
6.3	CORRELATIONS.....	221
6.4	EMPIRICAL	
6.4.1	Main Findings.....	223
6.4.2	Robust Test.....	232
6.5	CONCLUSION.....	239

## **CHAPTER 7            CONCLUSIONS**

7.1	INTRODUCTION.....	241
7.2	RELEVANT THEORIES AND HYPOTHESES.....	241
7.3	TRENDS AND DESCRIPTIVE ANALYSIS.....	243
7.4	PRIVATE SAVINGS AND ITS DETERMINANTS.....	248
7.5	FINANCIAL DEVELOPMENT AND GROWTH.....	251
7.6	PRIVATE SAVINGS AND NON-MARKET INSTITUTIONAL FACTOR.....	255
7.7	RECOMMENDED FUTURE STUDIES.....	259



## **LIST OF TABLES**

	<b>Pages</b>
Table 3.5.1.1 LATIN AMERICA Private Savings.....	122
Table 3.5.1.2 MENA Private Savings.....	123
Table 3.5.1.3 ASIA PACIFIC Private Savings.....	124
Table 3.5.2.1 LATIN AMERICA GDP Per Capita Growth.....	125
Table 3.5.2.2 MENA GDP Per Capita Growth.....	126
Table 3.5.2.3 ASIA PACIFIC GDP Per Capita Growth.....	127
Table 3.5.3.1 LATIN AMERICA Credit to Private Sectors.....	127
Table 3.5.3.2 MENA Credit to Private Sectors.....	128
Table 3.5.3.3 ASIA PACIFIC Credit to Private Sectors.....	129
Table 3.5.4.1 LATIN AMERICA Inflation.....	130
Table 3.5.4.2 MENA Inflation.....	131
Table 3.5.4.3 ASIA PACIFIC Inflation.....	131
Table 3.5.5.1 LATIN AMERICA Real Deposit Rate.....	132
Table 3.5.5.2 MENA Real Deposit Rate.....	133
Table 3.5.5.3 ASIA PACIFIC Real Deposit Rate.....	133
Table 3.5.6.1 LATIN AMERICA Youth Dependency Population.....	134
Table 3.5.6.2 MENA Youth Dependency Population.....	134
Table 3.5.6.3 ASIA PACIFIC Youth Dependency Population.....	135
Table 3.5.7.1 LATIN AMERICA Old Dependency Population.....	136
Table 3.5.7.2 MENA Old Dependency Population.....	136
Table 3.5.7.3 ASIA PACIFIC Old Dependency Population.....	137

Table 3.5.8.1	LATIN AMERICA Urban Growth.....	137
Table 3.5.8.2	MENA Urban Growth.....	138
Table 3.5.8.3	ASIA PACIFIC Urban Growth.....	139
Table 3.6.1	LATIN AMERICA Savings & Determinants.....	140
Table 3.6.2	MENA Savings & Determinants.....	141
Table 3.6.3	ASIA PACIFIC Savings & Determinants.....	142
Table 4.1	Correlation Savings & Determinants.....	155
Table 4.2	SUR Pool Regression All Emerging Economies.....	158
Table 4.3	SUR Pool Regression Asia Pacific Region.....	165
Table 4.4	SUR Pool Regression MENA Region.....	170
Table 4.5	SUR Pool Regression Latin American Region.....	174
Table 6.2	Correlation Savings & Non-Market Institutional Determinants.....	222
Table 6.4	Fixed Effect with ICRG Non-Market Institutional Factors.....	226
Table 6.5	Fixed Effect with Kaufman Non-Market Institutional Factors.....	234

## LIST OF FIGURES

	Pages
Figure 2.1 Solow-Swan Model: Rate of capital increasing at diminishing rate.....	42
Figure 2.4 Solow-Swan Model: Link between savings, capital and output .....	43
Figure 2.3 Solow-Swan Model: Growth rate of income per efficiency worker.....	44
Figure 2.4 McKinnon-Shaw model: Impact of interest rates ceilings on savings and investment.....	50
Figure 5.1 Unit Root Test: Credit to Private Sector and GDP Per Capita.....	193
Figure 5.2 Hausman Test: Choose between Fixed versus Random Effect.....	195
Figure 5.3 Hausman Test: Choose between Fixed versus Random Effect.....	197
Figure 5.4 Panel Data Granger Causality Test.....	198
Figure 5.5a Panel Unit Root Test: Log GDP Cap Per Capita.....	200
Figure 5.5b Panel Unit Root Test: Credit to Private Sector.....	200
Figure 5.6 Pedroni panel cointegration Test.....	201
Figure 5.6a Lag determination for Cointegration Test.....	203
Figure 5.7 Pantula Method to determine model to choose.....	205
Figure 5.8 VECM: Determining weak exogeneity for per capita variable.....	208
Figure 5.9 VECM: Determining Weak Exogeneity for credit to private sector variable.....	209
Figure 6.1 Redundant Fixed Effect Determining using pool or panel estimation.....	217
Figure 6.2 Hausman Test: Determining between Fixed or Random Effect.....	224

## LIST OF EXHIBITS

APPENDIX/PAGE

### **ARGENTINA**

Exhibit 1.1	Argentina: GDP Per capita Growth from 1970 to 2006.....	A1-1
Exhibit 1.2	Argentina: Credit to Private sector over GDP from 1970 to 2006.....	A1-1
Exhibit 1.3	Argentina: Inflation from 1970 to 2005.....	A1-1
Exhibit 1.4	Argentina: Total Debt Service over GNI from 1970 to 2006.....	A1-1
Exhibit 1.5	Argentina: Use of IMF Credit from 1970 to 2006.....	A1-1
Exhibit 1.6	Argentina: Peso over USD from 1970 to 2006.....	A1-1
Exhibit 1.7	Argentina: Gross Domestic Investment over GDP from 1970 to 2006.....	A1-1

### **BRAZIL**

Exhibit 2.1	Brazil: GDP Per capita Growth from 1970 to 2006.....	A1-2
Exhibit 2.2	Brazil: Inflation from 1970 to 2005.....	A1-2
Exhibit 2.3	Brazil: FDI (USDMM) from 1970 to 2006.....	A1-2
Exhibit 2.4	Brazil: Total Debt Service/ GNI from 1970 to 2006.....	A1-2
Exhibit 2.5	Brazil: Use of IMF Credit from 1970 to 2006.....	A1-2
Exhibit 2.6	Brazil: Brazil Currency over USD from 1970 to 2006.....	A1-2

### **MEXICO**

Exhibit 3.1	Mexico: GDP Per capita Growth from 1970 to 2006.....	A1-3
Exhibit 3.2	Mexico: Inflation from 1970 to 2005.....	A1-3

### **CHILE**

Exhibit 4.1	Chile: GDP Per capita Growth from 1970 to 2006.....	A1-3
Exhibit 4.2	Chile: Inflation from 1970 to 2005.....	A1-3

Exhibit 4.3	Chile: Manufacturing Output over GDP from 1970 to 2006.....	A1-3
-------------	---	------

## **VENEZUELA**

Exhibit 5.1	Venezuela: GDP Per capita Growth from 1970 to 2006.....	A1-4
-------------	---	------

Exhibit 5.2	Venezuela: Inflation from 1970 to 2005.....	A1-4
-------------	---	------

Exhibit 5.3	Venezuela: Use of IMF Credit (USDMM) from 1970 to 2006.....	A1-4
-------------	---	------

## **COLUMBIA**

Exhibit 6.1	Colombia: GDP Per capita Growth from 1970 to 2006.....	A1-4
-------------	--	------

Exhibit 6.2	Colombia: Use of IMF Credit from 1970 to 2006.....	A1-4
-------------	--	------

Exhibit 6.3	Colombia: Agriculture Output over GDP from 1970 to 2006.....	A1-4
-------------	--	------

## **SAUDI ARABIA**

Exhibit 7.1	Saudi Arabia: GDP Per capita Growth from 1970 to 2006.....	A1-5
-------------	--	------

Exhibit 7.2	Saudi Arabia: Inflation from 1970 to 2005.....	A1-5
-------------	--	------

Exhibit 7.3	Saudi Arabia: Historical oil price from 1970 to 2005.....	A1-5
-------------	---	------

## **EGYPT**

Exhibit 8.1	Egypt: GDP Per capita Growth from 1970 to 2006.....	A1-5
-------------	---	------

Exhibit 8.2	Egypt: Inflation from 1970 to 2005.....	A1-5
-------------	---	------

## **TURKEY**

Exhibit 9.1	Turkey: GDP Per capita Growth from 1970 to 2006.....	A1-6
-------------	--	------

Exhibit 9.2	Turkey: Inflation from 1970 to 2005.....	A1-6
-------------	--	------

Exhibit 9.3	Turkey: Total Debt Service over GNI from 1970 to 2006.....	A1-6
-------------	--	------

Exhibit 9.4	Turkey: Use of IMF Credit (USDMM) from 1970 to 2006.....	A1-6
-------------	--	------

Exhibit 9.5	Turkey: Inflow Remittance Over GNI from 1970 to 2006.....	A1-6
-------------	---	------

## **ISRAEL**

Exhibit 10.1 Israel: GDP Per capita Growth from 1970 to 2006.....	A1-7
Exhibit 10.2 Israel: Inflation from 1970 to 2005.....	A1-7

## **MOROCCO**

Exhibit 11.1 Morocco: GDP Per capita Growth from 1970 to 2006.....	A1-7
Exhibit 11.2 Morocco: Agriculture Output over GDP from 1970 to 2006.....	A1-7
Exhibit 11.3 Morocco: Private Saving over GDP from 1970 to 2006.....	A1-7
Exhibit 11.4 Morocco: Inflation from 1970 to 2006.....	A1-7

## **TUNISIA**

Exhibit 12.1 Tunisia: GDP Per capita Growth from 1970 to 2006.....	A1-8
Exhibit 12.2 Tunisia: Inflation from 1970 to 2005.....	A1-8

## **SOUTH AFRICA**

Exhibit 13.1 South Africa: GDP Per capita Growth from 1970 to 2006.....	A1-8
Exhibit 13.2 South Africa: Price of Gold (USD) from 1970 to 2006.....	A1-8
Exhibit 13.3 South Africa: Private savings over GDP from 1970 to 2006.....	A1-8

## **INDIA**

Exhibit 14.1 India: GDP Per capita Growth from 1970 to 2006.....	A1-9
Exhibit 14.2 India: Inflation from 1970 to 2005.....	A1-9.
Exhibit 14.3 India: FDI over GDP from 1970 to 2006.....	A1-9
Exhibit 14.4 India: Total Export over GDP from 1970 to 2006.....	A1-9

Exhibit 14.5 India: Total Service over GDP from 1970 to 2006.....A1-9

Exhibit 14.6 India: Manufacturing Output over GDP from 1970 to 2006.....A1-9

## **SOUTH KOREA**

Exhibit 15.1 South Korea: GDP Per capita Growth from 1970 to 2006.....A1-10

Exhibit 15.2 South Korea: Inflation from 1970 to 2005.....A1-10

## **PHILIPPINES**

Exhibit 16.1 Philippines: GDP Per capita Growth from 1970 to 2006.....A1-10

Exhibit 16.2 Philippines: Inflation from 1970 to 2005.....A1-10

Exhibit 16.3 Philippines: Manufacturing Growth from 1970 to 2006.....A1-10

## **INDONESIA**

Exhibit 17.1 Indonesia: GDP Per capita Growth from 1970 to 2006.....A1-11

Exhibit 17.2 Indonesia: Inflation from 1970 to 2005.....A1-11

Exhibit 17.3 Indonesia: FDI over GDP from 1970 to 2006.....A1-11

Exhibit 17.4 Indonesia: Agriculture Output over GDP from 1970 to 2006.....A1-11

Exhibit 17.5 Indonesia: Manufacturing Output over GDP from 1970 to 2006.....A1-11

Exhibit 17.6 Indonesia: Private Savings Over GDP from 1970 to 2006.....A1-11

## **THAILAND**

Exhibit 18.1 Thailand: GDP Per capita Growth from 1970 to 2006.....A1-12

Exhibit 18.2 Thailand: Inflation from 1970 to 2005.....A1-12

Exhibit 18.3 Thailand: Use of IMF Credit (USDMM) from 1970 to 2006.....A1-12

Exhibit 18.4 Thailand: Manufacturing Output over GDP from 1970 to 2006.....	A1-12
Exhibit 18.5 Thailand: Total Service over GDP from 1970 to 2006.....	A1-12
Exhibit 18.6 Thailand: Agriculture Output over GDP from 1970 to 2006.....	A1-12
Exhibit 18.7 Thailand: Bhatt per USD from 1970 to 2006.....	A1-12

## **MALAYSIA**

Exhibit 19.1 Malaysia: Private Savings Over GDP from 1970 to 2006.....	A1-13
Exhibit 19.2 Malaysia: GDP Per capita Growth from 1970 to 2006.....	A1-13
Exhibit 19.3 Malaysia: Inflation from 1970 to 2005.....	A1-13
Exhibit 19.4 Malaysia: FDI (USDMM) from 1970 to 2006.....	A1-13
Exhibit 19.5 Malaysia: Manufacturing Output over GDP from 1970 to 2006.....	A1-13
Exhibit 19.6 Malaysia: Ringgit per USD from 1970 to 2006.....	A1-13
Exhibit 19.7 Malaysia: Gross Domestic Investment (USDMM) from 1970 to 2006.....	A1-13

## **SINGAPORE**

Exhibit 20.1 Singapore: GDP Per capita Growth from 1970 to 2006.....	A1-14
Exhibit 20.2 Singapore: Inflation from 1970 to 2005.....	A1-14
Exhibit 20.3 Singapore: Manufacturing over GDP from 1970 to 2006.....	A1-14
Exhibit 20.4 Singapore: Singapore dollar per USD from 1970 to 2006.....	A1-14
Exhibit 20.5 Singapore: Manufacturing Growth from 1970 to 2006.....	A1-14
Exhibit 20.6 Singapore: Merchandise over GDP from 1970 to 2006.....	A1-14
Exhibit 20.7 Singapore: Private Savings Over GDP from 1970 to 2004.....	A1-14



## **ABSTRACT**

### **ABSTRACT**

In the 1950s and 1960s, after gaining independence from their colonial powers, most developing countries adopted “market substitution” as their policy for economic development and growth. In essence, this was an industrialisation strategy followed by these developing economies to concentrate on home-grown products and nurture their expertise in order to reach the status of industrialised nations. However, by the end of 1970s, many developing countries began to realize the failures of their inward-looking approach to industrialization when their economies were mired with high unemployment, inflation and chronic external debt. By the middle of 1980s, many of these countries began to change their policies and reorient themselves into market economies. However, with financial crises and economic recessions that resulted from pursuing market driven liberalization policies, these economies began to realize the flaws of the market driven approach to industrialization. Nevertheless, they continued with the liberalised policies incorporating market as well as non-market (institutional) reforms, aimed at strengthening regulation, improving corporate governance and curbing corruption to avoid the destabilising consequences of financial liberalization.

The evolving economic policies that influenced financial development and growth in developing economies came about with the objective of enhancing household and private sector’s savings. These policies have been designed to influence financial development and economic growth (which can impact upon private savings) in two different ways: (i) by increasing saving due to households taking precautionary motives, or (ii) negatively by spending more due to increase in

overall expenditures. Theoretically, the combined effect on private saving is therefore ambiguous. The purpose of this thesis is to assess empirically the importance of various economic factors influencing private sector savings in emerging market economies. In addition, the influence of non-market institutional factors on savings is explored from the incorporation of newly institutional measures into these countries economic policies.

Several econometric methodologies are employed with empirical analysis conducted on data for twenty emerging economies across three primary regions in the world, i.e. Asia Pacific, Middle East and North African (MENA), and South America. The twenty countries also include other emerging economies that are proximate to MENA regions such as South Africa, Turkey and Israel. In general, the findings based on SUR (Seemingly Unrelated Regression) methodology show that per capita growth, financial development, government savings, and trade openness have a positive impact on private savings; while youth and old dependency-age groups, real interest rate, and urban growth have a negative effect on private savings. In general, most of these results are consistent with previous studies for other countries.

Additionally, causality tests are conducted using Vector Autoregressive (VAR) methodology as well as Pedroni and Johansen cointegration methods within the Vector Error Correction (VEC) model to determine both short-term and long-term causality effects between financial development and economic growth. The results indicate that in the long run financial development has a causal effect on growth; however, in the short run the results are quite mixed. For example, the short run result using the VAR method shows that income growth has Granger causality effect on financial development, but the F-test result for the VEC method shows evidence of bivariate causality. The long-term causality results also confirm the finding of

previous research about the importance of developing financial sector in order to spur the country's economic growth.

The final empirical investigation is to conduct panel data regression to test the impact of non-market institutions on private savings. The main result here is that sound institutional factors based on respect for property rights (e.g. bureaucracy, accountability and regulation quality) have a positive effect on aggregate private savings. Furthermore, political stability is found to have a negative impact on savings while efficient bureaucracy has a positive impact on savings. It can be construed that with an uncertain political environment, i.e. diminishing political stability, the public in general would save more than spend. On the other hand, efficient bureaucracy would boost public confidence about the country's governance, which can lead to increased overall savings by the public.

## LIST OF ABBREVIATIONS USED

CPF	Central Provident Fund
CPI	Consumer Price Index
ECM	Error Correction Model
EPF	Employee Provident Fund
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GLS	General Least Square Estimator
GNI	Gross National Income
HLM	Harberger–Laursen–Metzler model
ICRG	International Country Risk Guide
LCH	Life Cycle Hypothesis
MENA	Middle East and North African
Openness	Trade Openness
PIH	Permanent Income Hypothesis
SUR	Seemingly Unrelated Regression
TOT	Terms of Trade
VAR	Vector Autoregressive
WDI	World Development Indicators
WGI	Worldwide Governance Indicators
WLS	Weight Least Square Estimator

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## **CHAPTER 1      INTRODUCTION**

### **1.1    INTRODUCTION**

In the 1950s and 1960s after gaining independence from their colonial powers, most of developing countries found that their economies were impoverished. The only way to play catch up to the high living standard enjoyed by the developed nations was to develop their own industries by exploiting their own rich natural resources. By early 1960s until most of 1970s, majority of the economic policies employed by these developing countries were based on market substitution policies, which promoted development of local industry rather than relying on imported goods to satisfy their consumers' market. The countries tend to impose selective tariffs and established restrictive trade policies to prevent imported goods to compete directly with domestically produced products. High import tariffs, industrial licensing, and price control became the prevailing economic mantra. State owned enterprises or cooperatives were set up by the government to spearhead development in key industrial areas since the private sectors were reluctant to undertake due to riskiness and sheer size of the projects.

During the 1950s and 1960s, most of the economists were of view that the problem holding back the development of these countries was not only due to capital shortages, but due to inefficient use of the resources (Meier and Baldwin, 1957). Most of the needed capital was from foreign aid, taxation and deficit finance. But the majority of financing was derived from the increased in domestic savings (Little, 1982; Lewis, 1984).

The idea of how to improve the domestic savings was originally based on the Keynesian model that income is the main driver for savings. Keynes argument was that the effect of real interest rates on savings is difficult to ascertain, i.e. which is more dominant, either substitution or income effect should the interest rate be increased (Keynes, 1936). Keynesian assumption was that since the effect of interest

rate on savings is secondary and difficult to predict, interest rate can be set low enough by banks to encourage loans for investment but yet profitable enough that could increase overall domestic income.

Hence, during the early stage of implementation of import-substitution policy, these countries experienced increased growth and income. However, as times passed by, the manufacturing sectors began to suffer from high cost, less productivity growth and eventually had to succumb to extensive losses. In addition, the quality of the domestically produced products were as not as reliable as the imported ones. The manufacturers had become complacent in protecting the quality of their products knowing they would be cheaper than the imports due to high tariffs. Eventually, the notion of catching up with the rest of developed countries was never materialized. By the middle of 1970s, there were several studies probing the success and failures of import-substitution industries. The seminal work by Shaw (1973) and McKinnon (1973) which was based on the works of Gurley and Shaw (1955) rejected the monetary models of Keynes, and Keynesians economist, which advocated for low controlled interest rates and financial repression. The newer literatures promoted financial liberalisation and pointed to the weakness of growth retarding effect of financial repression.

In developing economies, financial markets were poor and underdeveloped, hence bank loans and self-financing became the major source for financing. The choice to store the money are quite limited, therefore the economy tends to be highly money intensive. Due to concentration of holding money, low deposit rates tend to encourage the population to consume now rather than later, which resulted lower overall aggregate savings and investment levels.

In essence, McKinnon (1973) and Shaw (1973) argued that financial repression caused disequilibrium, which distorted the market from clearing and serving the allocative function in the most efficient way. The government tended to impose ceiling on interest rates for deposits and loans. As a result, it created

shortages of funds as those with surplus funds would rather invest elsewhere rather than keeping their money in low return deposit account. It also contributed to misallocation of funds as the government tended to distribute available funds to preferred sectors rather than to those that can best utilise the funds. The result is inefficient usage of funds, which then contributed to slow economic growth.

Shaw's (1973) exposition of the adverse impact of low interest rates on investment is rooted in the debt-intermediation process. According to his view, shortages of funds resulted from low interest rate that discouraged the population from depositing their savings, which then reduced loanable funds available in the banking system. Shaw argued that by liberalizing the financial system and deepening the financial sectors, increased financial transactions between savers and borrowers would result. These two factors have the effect of increasing the returns to the depositors as well as lessening the investor's real cost via risk reduction through greater financial diversification and increased operational efficiency in the financial system.

The Mc Kinnon-Shaw doctrine calling for ending financial repression together with exhortation for outward oriented trade and industrial policy soon became the new mantra for developing countries. The new paradigm shift towards liberalizing the economy together with strong encouragement by IMF-World Bank had resulted in increasing number of developing countries shifting from import-substitution and financial repression policies to a more open orientated policies favouring trade and financial liberalisation.

These governments realised the need to increase domestic savings and the only way to reform their economy was by liberalizing their financial market. According to McKinnon (1973) and Shaw (1973), financial liberalisation can affect growth via: i) expanding and improving the financial system efficiency ii) provide opportunities for the local companies to access fund from international financial



market iii) improve transparency and governance in the domestic financial sector. Initiatives to liberalise the financial market began globally with the resolution from Washington Consensus urging developing countries, especially Latin American countries to reform and liberalise their financial markets and institutions. Originally, the Washington Consensus was the result from John Williamson's proposition in 1989 for a desirable policy framework for economic growth based on good governance reform. The initial form of Washington consensus was simple policy changes based on ten main principles: i) liberalisation of trade, ii) elimination of currency overvaluation, iii) reduction on fiscal deficit, iv) tax reformation, v) interest rate liberalisation, vi) liberalisation on foreign direct investment, vii) privatisation of government assets, viii) deregulation of the financial markets, ix) reorientation of the public expenditure towards offering better returns and x) improved income distributions and finally xi) security of property rights.

By the end of 1990s the original Washington Consensus was improved to be heavily based on institutional reform. The main reason for the improvement was the recognition that the market-oriented policies are not sufficient without institutional restructuring. In addition, there was concern that trade liberalisation may not able to reallocate the economy resources equitably and that financial liberalisation may lead to excessive volatility (Rodrik, 2006).

The newly augmented Washington Consensus mainly emphasized on governance with the following aims: i) reduction in corruption, ii) improving regulatory structure, iii) ensuring the independence of the monetary and fiscal institution from political meddling, iv) strengthening corporate governance, v) improving the judiciary system, vii) providing social safety net, reducing poverty, viii) non-interference exchange rate regime, compliance to WTO rules, ix) adherence to financial codes and standards and x) prudent capital account opening. The new Washington Consensus was referred by the world community as the principle of economic reform until its demise in 2008 as a result of the recent global

financial crisis. The governments around the world soon realised that the augmented Washington Consensus policies were not the panacea to prevent the economic turmoil from recurring.

Even when most Asian developing economies began to amass sizeable savings in the 1990s, they could not prevent the Asian financial crisis experienced in 1997. Most of the domestic savings together with foreign capital were mostly used for investments that were channelled to build the countries' extensive infrastructure and provide growing social services. Due to the excessive borrowing to meet the catch up mentality of achieving "developed nation status", it has caused most of the economies exposed to negative shock from capital market volatility.

After the financial crisis shock, most developing nations have begun establishing varying types of institutional frameworks based on the Augmented Washington Consensus to recover to their pre-financial crisis growth level. As a result, several developing nations, especially Asian economies, have grown leaps and bounds in terms of economic growth. The financial crisis of Latin American countries, e.g. Argentina and Mexico, however is taking longer, i.e. from 1999 to 2002, before recovering. Their growth has been quite modest since most of them have to address the dire economic and financial problems in order to boost savings and investment back into their economy.

## **1.2 EMERGING ECONOMIES**

The term emerging market economies was first coined in 1980's by the World Bank economist Antoine van Agtmael. Carl Olsson (2002, p147) defined emerging markets as "those countries which have started to grow but have yet to reach a mature stage of development and where there is significant exposure for economic or political instabilities". However, the term "emerging economies" or "emerging market" is still loosely used and subjected to various interpretations. Many of the definitions are based on GDP per capita of a country which defines whether a country is able to be

classified as an emerging economy. However, that definition failed to consider the potentiality for the country to grow further in the near future. According to Xin Huang (2007), emerging economies are those countries that were not only experiencing problems with their economies, but have great potential for further development. Hence, there are those considered lesser developed, but yet being classified as ‘emerging economies’ due to the growth potentialities of these countries. There is general understanding that the scope of emerging economy includes the following geographic areas, i.e.:

- i. Latin America ( Mexico, Brazil, Argentina, etc)
- ii. Africa and Middle East (South Africa, Algeria, Egypt, Tunisia, and Morocco)
- iii. Subcontinents ( Pakistan, India, Sri Lanka etc)
- iv. Southeast Asia (Malaysia, Indonesia, Singapore, etc)
- v. Greater China ( mainland China, Taiwan, Hong Kong, Macao, etc)

According to Kose and Prasad (2010), between 1965 until 1985, the developed economies on average accounted for nearly three quarter of the world GDP adjusted in purchasing power parity. By 2008 and 2009, their contribution share had declined to 57 percent. In contrast, the share of emerging economies has risen from 17 percent in 1960’s to 31 percent by mid 1980’s and 40 percent by 2008-2009.

According to the Economist (2006), the exports of the emerging economies have grown from 20 percent in 1970 to 42 percent in 2005 and produced half of the world output measured at purchasing-power parity. They also hold about two thirds of the world foreign exchange reserves and consume 47% of the world oil.

Between 1973 and 1985, the developed economies accounted for 60 percent of the 3.4 percent annual world growth, whereas the emerging economies contributed only about 30 percent. However, from

1987 until 2007, the average growth of the world GDP was 3.7 percent and the emerging economies contributed 47 percent, in contrast the developed economies shares fell to 49 percent.

The Economist (2011) reported that 40 percent of global consumption was from the emerging market and therefore a slowdown in these economies would pose substantial risk not only to the growth of the developed economies but also to the world.

This shows that through progressive liberalisation policies, these emerging economies have been able to transform into one of the most dynamic and vibrant world economic groupings. As their economy expanded and become more globally integrated, the economic policies that they pursued have greater impact toward the rest of the world economies (Anand, 2009). Furthermore, Kose and Prasad (2010) argue that emerging economies as a group create a decoupling impact from the rest of the world when they enter into multilateral financial and trade agreements as well as engaged in trading amongst them (Kose and Prasad, 2010). Eventually, they may not need to rely heavily on other developed nations as trading partners to generate growth. This was exemplified by the recent 2007 and 2008 financial meltdown experienced mostly by developed countries, in which most emerging economies, especially Asia Pacific economies did not experience the contagion effect (Kose and Prasad, 2010). Even those that experienced it, e.g. the Latin America countries, their economies managed to rebound quite rapidly. Hence, it is indispensable to study the dynamics of the emerging economies as they will become the future major contributor for world economic growth.

### **1.3 MOTIVATION FOR THE STUDY**

The main aim of this thesis is to understand the role of non-market institutional factors in affecting aggregate private savings in emerging economies. Several emerging economies have been selected from three different regions, i.e. Asia Pacific, Latin America and MENA (Middle East and North

African). There have been numerous hypotheses and models discussed in the literature on savings behaviour, such as Life Cycle Hypothesis (LCH), Permanent Income Hypothesis (PIH), Consumer Optimization Model and Solow-Swan Model. These hypotheses are discussed mainly with respect to how the changes in savings are affected by demographic, financial and macroeconomic factors.

On the other side, there are other studies that discuss the origins of law and historical background that lead to the establishment of the non-market institutions that exist currently. The study by La Porta (1997) on Law and Finance Hypothesis, and Acemoglu et al (2001, 2004) based on two hypotheses, i.e. endowment and political process, led to understanding the evolution of institutions and their impact on economic growth. In addition, leading economies, such as North (1990), Dixit (2004, and 2009) and Rodrik (2000, 2006 and 2008), advocated the importance of institutions to spur and sustain economic growth. Based on these two disciplines of study, there is a gap that none of the studies examined the impact of institutional factors towards aggregate savings. This is our main focus as we will examine the impact of several non-market institutions towards aggregate savings. As such we have developed our hypothesis in section 2.7 of Chapter 2. In our case, we have focused primarily on emerging economies as these economies are the future driver for the world economic growth.

## **1.4 RESEARCH AIMS AND HYPOTHESIS**

The aim of the thesis is to examine the determinants of private savings in emerging market economies with regard to the importance of financial development, economic growth and institutional quality. The specific research objectives and hypotheses are

### **1.4.1 Research Objectives:**

- I. Review relevant theories and empirical evidence on economic growth and savings, analyzing the importance of the role of financial development and institutions.

- II. Conduct country-level econometric analysis to test the causality between economic growth and financial development using both Vector Autoregressive (VAR) and Vector Error Correction (VEC) models for selected emerging economies
- III. Estimate savings behaviour for emerging economies using Seemingly Unrelated Regression (SUR) and panel data regression methods to analyse the impact of traditional determinants, i.e. demographic and macroeconomic variables, as well as of non-market variables, e.g. institutional quality.

#### 1.4.2 Hypothesis

Three hypotheses that have been formulated and examined:

- I. Sound institutional factors based on property rights have positive effect in increasing aggregate private savings in the emerging economies.
- II. Financial development has a short term Granger causality effect on economic growth of the emerging economies.
- III. Financial development has a long term causality effect on economic growth of the emerging economies.

Detailed explanation of the above hypotheses is given in Chapter 2: section 2.9. The evaluation (reaffirmation or repudiation) of the hypotheses is discussed in Chapter 7: section 7.5.

### **1.5 OUTLINE STRUCTURE OF EACH CHAPTER**

- I. Chapter 1: Introduction
- II. Chapter 2: Review of theories and empirical evidence on :

- i) Savings and Growth: Solow-Swan, Life Cycle Hypothesis, Permanent Income Hypothesis, Consumer Optimization Model.
  - ii) Financial Development and Growth: Endogenous Growth and McKinnon-Shaw Hypothesis.
  - iii) Institutions and Growth: Legal Origin and Endowment Hypothesis.
- III. Chapter 3:
  - i) Synopsis on the economic growth of the 20 emerging economies: Major economic and political events are highlighted that have a significant impact on the growth of these countries.
  - ii) Analysis by region: Trends on savings, growth and other macroeconomic variables from 1970 until 2003.
- IV. Chapter 4: Examines the effect of aggregate private savings using Seemingly Unrelated Regression (SUR) estimation methodology in 20 emerging economies. Using LCH framework to examine their effects of demographic and macroeconomic variables on private savings.
- V. Chapter 5: Examines short-term and long-term causality effect between financial development and growth using Vector Autoregressive (VAR) and Vector Error Correction (VEC) models for the 20 emerging economies. Endogenous growth theory and McKinnon and Shaw financial liberalization approach have improved our understanding of the importance of financial development on economic growth. However, the key question is: Is it vital to develop the financial sector first before expecting growth, or, can it be growth first before developing financial

sectors? This chapter attempts to determine the causality effect in order to identify which variable drives the other to spur aggregate private savings.

VI. Chapter 6: Examines the effects of institutional quality on aggregate private savings in the 20 emerging economies using fixed effect panel data estimation method. The legal origin (La Porta, 1999), endowment (Acemoglu, 2001) and political process (Acemoglu, 2004) hypotheses have attempted to explain the importance of non-market institutions and their link with the current state of economic growth. Utilizing institutional variables obtained from International Country Risk Guide (ICRG) and Kaufman, Kraay, and Mastruzzi (2007), we have used them to find the impact of institutional factors on private savings.

VII. Chapter 7: Conclusions and recommendation for the next research



## **CHAPTER 2**

### **THEORIES ON SAVINGS AND GROWTH**

#### **2.1 INTRODUCTION**

Previous studies on private savings were mostly focused on examining the effect the economic and demographic variables on savings. Similarly, studies and empirical evidence relating to institutions have concentrated on their impact towards the country's growth and financial development. Hence, there is no previous model or hypothesis that draws on the direct relationship between the institutional impacts on savings, although the impact can be indirect through economic growth and other factors. Therefore, in order to formulate our hypotheses regarding the effects of institutions on savings, there needs to be a discussion of previous theories regarding savings and growth. This chapter provides an overview of several theories and empirical evidence on savings and growth.

The chapter is divided into two major parts. The first part reviews theories and evidence on savings. The second part reviews theories and evidence on growth.

The discussion on savings is divided further into three sections. The first section dealt with micro theory on savings, i.e. Consumer Optimization Model by Ramsey (1928), Cass (1965) and Koopmans (1986), which discusses intertemporal choice between savings and consumption. The second section is on macro theory on savings, which provides overview on Permanent Income Hypothesis and Life Cycle Hypothesis. The third section discusses previous empirical evidence on savings.

The discussion on growth is also subdivided into three sections. The first section reviews the neoclassical Solow-Swan (1956) growth model particularly the relationship between growth and savings.

The second section explores the relationship between growth and financial development as both have significant affect on savings. Studies on the relationship between growth and financial development have branched out into two schools. The first set of models view financial institutions as the entrepreneurial driving force behind ensuring the efficiency of the financial transactions. Essentially, the models discuss about the role of financial institutions in pooling financial resources effectively. The hypotheses are based on models developed by Diamond and Dybvig (1983), Diamond (1984), Greenwood and Jovanovic (1990), Becievenga and Smith (1991), and Pagano (1993). The other set of models look into the role of financial liberalization in promoting financial deepening. McKinnon and Shaw argue that financial repression has adverse effects on savings, investments and growth. By eliminating the artificially set interest rates ceiling, it allows the individuals to invest their funds to earn the expected returns and for financial institutions to allocate resources to economic sectors that are able to generate the highest return.

The discussion linking growth and financial development theories is also followed by a review of previous empirical evidence on the inter-relationship between financial development and growth variables, i.e. on finding the causality effect. It is crucial especially for the policy makers to find the causality effect to identify which factors to deal first as both factors could affect aggregate savings: - Is it vital to develop or deepen the financial system first in order to spur economic growth; or alternatively, focus on stimulating the economic growth first as it would drive the deepening of financial system?

Finally, the third section on growth explores several hypotheses that discuss the evolution of formal institutions and how they affect the current economic development of a country. Recent hypotheses by La Porta (1997, 2000) on legal origin and by Acemoglu et al (2001, 2004) on endowment and political disposition are based on historical records that are used as evidence that lead to the current

legal and economic development of most countries. Following the discussion on La Porta (1997, 2000) and Acemoglu et al (2001, 2004) are empirical evidence discussing on the effects of institutions on growth.

In section 2.4, we will relate the importance of reviewing previous theories and provide the rationale for relating them with the empirical analysis undertaken in later chapters.

Lastly, we formulate our own hypothesis by exploring the dynamics on the effects and importance of institutional factors, such as property rights and rule of law have on aggregate savings. Based on our hypothesis on the effect of institutions on savings together with the previous discussed hypothesis on growth and savings theories, we test empirically the relationship between savings, growth, financial development and non-market institutional factors in chapters 4, 5 and 6 for the 20 emerging economies.

## **2.2 SAVINGS THEORIES AND EMPIRICAL EVIDENCE**

### **2.2.1 Micro Oriented theory of Savings - Consumer Optimization Model**

Ramsey (1928), Cass (1965) and Koopmans (1986) work and model the economy as a single and infinitely lived representative consumer. Essentially, Ramsay's approach of "Consumer Optimization model" is that an individual's objective is to maximize a utility function over a certain period. The individual is motivated not to consume all within the current period, but to extend it over time homogeneously as possible. In this intertemporal setting, a rational agent will compare the marginal rate of substitution between current versus future consumption by postponing the consumption. By forgoing the current consumption, the individual can save to earn a higher return. The optimal savings is based on

Ramsey's theory, in which saving is optimal if marginal utility growth rate is equal to the difference between the utility discount rate and the real rate of return on savings.

The model starts with households that provide labour services in exchange of receiving salaries, wages, and saved them by accumulating asset. The basic assumption is that households are identical, i.e. having the same salary and asset per person.

Assuming that  $H$  stood for identical households with each household at time  $t$  represent as  $L(t)/H$ . Each household grows at rate  $n$ . Since  $L(t)$  is the number of members in the household, and  $c(t) \equiv C(t)/L(t)$  is the consumption of each member, the household's utility function is the aggregation of utilities of all the household members, both present and future ( $L = e^{nt}$ ). Assuming each household wishes to maximise overall utility,  $U$ , as expressed by:

$$\int_0^{\infty} u[c(t)] \cdot e^{nt} \cdot e^{-\rho t} dt \quad \text{Equation 2.1}$$

The assumption is that the household's utility at time 0 is a weighted sum of all future flows of utility,  $u(c)$ . The function  $u(c)$  or the felicity function represents household utility consumption ( $c$ ) at any point in time.  $\rho$  stood for the constant discount rate or required rate on capital.

We assume that  $u(c)$  is increasing in  $c$  and concave—  $u'(c) > 0$ ,  $u''(c) < 0$ . The concavity characterise the smoothing of consumption over time, in which households prefer a relatively constant trend as compared to uneven consumption period, in which at certain time,  $c$  is low and other times,  $c$  is high. This desire to smooth consumption drives the household's savings behaviour because they will tend to borrow when income is relatively low and save when income is relatively high. We also assume that  $u(c)$  satisfies Inada conditions:  $u'(c) \rightarrow \infty$  as  $c \rightarrow 0$  and  $u'(c) \rightarrow 0$  as  $c \rightarrow \infty$ . Inada condition stipulated that

the marginal consumption approaches infinity as consumption goes to zero and approaches zero as consumption goes to infinity.

The other multiplier,  $e^{-\rho t}$ , involves the rate of time preference,  $\rho > 0$ . A positive or greater  $\rho$  means the net worth are valued less the later they are received. The hypothesis also assumes that the discount rate within a person's lifetime is the same across generations.

The following Euler equation stipulated that households choose consumption so that the rate of return ( $r$ ) is equivalent to the rate of time preference ( $\rho$ ) plus the rate of decrease of the marginal utility of consumption,  $u'$ , multiply with per capita consumption growth.

$$r = \rho - \left( \frac{du'/dt}{u'} \right) = \rho - \left[ \frac{u''(c) \cdot c}{u'(c)} \right] \cdot (\dot{c}/c) \quad \text{Equation 2.2}$$

$r$  is the rate of return to saving on the left side of equation while on the right side of equation is associated with the rate of return to consumption.

Household would be willing to sacrifice some consumption today for more consumption tomorrow, i.e.  $\dot{c}/c > 0$ , if they were to commensurate with interest rate ( $r$ ) that is greater than the discount rate ( $\rho$ ).

Therefore, the elasticity of marginal utility, i.e.  $\{-u''(c) \cdot c/[u'(c)]\}$  or the elasticity of  $u'(c)$  with respect to  $c$ , can be considered the premium for the household to forfeit current consumption in lieu of the future. This elasticity or the measurement for the concavity of  $u(c)$ , determines the disparity of rate of return ( $r$ ) over rate of preference ( $\rho$ ).

If the magnitude of elasticity is significant, the required premium of  $r$  over  $\rho$  is greater for a given value of  $\dot{c}/c$ . The equation can also be transformed into its common form, i.e.  $u(c) = \frac{c^{(1-\theta)}-1}{(1-\theta)}$  where  $\theta > 0$ , so

that the elasticity of marginal utility equals the constant  $-\theta$ . The extent of elasticity of marginal utility  $\{[-u''(c) \cdot c]/[u'(c)]\}$  can also be expressed as the reciprocal of the elasticity of intertemporal substitution.

On the other hand, the elasticity of substitution for this utility function is the constant  $\sigma = 1/\theta$  or recognised as '*Intertemporal Elasticity of Substitution*'. The higher is  $\theta$ , signified by the pace of decline of  $u'(c)$  with regards with increase in  $c$ , the lesser willingness to substitute consumption intertemporally, or to defer consumption for future date. The optimality condition from equation (2. 2) can then be expressed as:  $\dot{c}/c = \left(\frac{1}{\theta}\right) \cdot (r - \rho)$ . A lower willingness to substitute intertemporally, which indicated by greater  $\theta$ , denotes a smaller responsiveness of  $\dot{c}/c$  to the gap between  $r$  and  $\rho$  or smaller is the elasticity of the marginal utility of consumption. Household would be more indifferent to postpone consumption for the future, and would rather consume currently, which would negatively affect the rate for saving. On the other hand, households are willing to sacrifice some consumption today for future consumption, i.e. they are willing to save if  $\dot{c}/c > 0$ , and the intertemporal elasticity of substitution is large. This is also indicated by larger magnitude of elasticity of marginal utility of consumption that fills the gap between the rate of return and rate of time preference of the household.

In the Ramsey's model in reference to the neoclassical growth theory,  $s$  can fluctuate substantially as the economy develops and approaches the steady state. As capital per capita ( $\hat{k}$ ) rises, the decline in marginal product of capital,  $f'(\hat{k})$ , lessen the rate of return from savings ( $r$ ). The reduced motivation from saving— a negative intertemporal substitution effect— tends to lower the saving rate as the economy grows. Simultaneously, as ( $\hat{k}$ ) increase, the consumption tends to fall in relation to current income, eventually the saving rate tends to rise. This force — an income effect— as it tends to raise the saving rate as the economy develops. In crux, the saving rate is depended on which effect is dominant,

i.e. the substitutions or the income effect. The net effect is ambiguous in general, and the path of the saving rate during the transition can be complicated.

In summary, there are two effects resulting from the increase in the rates of savings, i.e. income effect against substitution effect. Income effect contributes to more household to deposit their earnings into savings. Intertemporal elasticity of substitution effect resulted in the postponement of the current consumption to the future. When intertemporal elasticity of substitution is less than one, income affect will dominate the substitution affect. The result will be negative effect on the net savings as the household would spend more than the realized returns. However, when the inter-temporal elasticity of substitution is greater than one, household would tend to postpone their consumption and would instead invest the residual income into savings. The net impact would be overall increase in the overall savings. When the inter-temporal elasticity of substitution is 1, the income and the substitution effect is the same, thus no net effect on the overall savings.

## 2.2.2 Macro Oriented Theory of Savings

### 2.2.2.1 Permanent Income Hypothesis (PIH)

According to (Deaton and Paxson, 1997), PIH is studied for its macroeconomic fluctuations and short-run dynamic relationship between consumption, savings and income. Friedman (1957) claims that both income and consumption be divided into two parts: a permanent and a transitory part. Permanent income is when one receives income over certain length of period and transitory income is considered all other factors, which are considered by the individuals as ‘accidental or chance’ occurrence, which can have positive or negative impact. Permanent income is a reflection of the individual’s wealth or the capital value. He argues the income of the individuals not only depended on his earning-ability but also his capital assets.

Essentially, Friedman perceives the consumer in terms of “human wealth” rather than income earner. The examples Friedman considers as transitory income are sickness or bad selection in buying or selling capital assets as these factors do not change fundamentally the amount consumed. He postulates that at aggregate level this transitory element in income will cancel out each other. Friedman believes that if there is permanent income, there should be permanent consumption, i.e. comprising permanent and transitory consumption. Transitory consumption is considered the residuals of consumption, for e.g., sickness and unplanned purchases. He argues that at the aggregate level, transitory consumption will cancel out each other.

Permanent and transitory variables are considered uncorrelated. Permanent income cannot be observed directly. The income that can be observed argued by Friedman is the measured income. The measured income,  $Y_m$  can be defined as the sum of permanent income ( $Y_p$ ) and transitory income,  $Y_t$ , as indicated in equation 1. Likewise, in equation 2.8, measured consumption can be defined as the sum of permanent consumption,  $C_p$ , and transitory consumption,  $C_t$ . The two equations are as follows:

$$Y_m = Y_p + Y_t \quad \text{Equation 2.3}$$

$$C_m = C_p + C_t \quad \text{Equation 2.4}$$

Equation 2.5 sums up the relations between consumption and income. Permanent consumption is the planned consumption out of permanent income and is assumed to be proportional to permanent income. The factor of proportionality  $k$ , need not be seen as constant. It is influenced by factors such as the rate of interest, wages and individual consumption preference.

$$C_p = k(i, w, u)Y_p; \quad \text{Equation 2.5}$$

in which  $i$  = rate of interest



$w$ = regular wages or revenue from capital investment

$u$ = consumers preference for immediate consumption rather than defer to late period.

PIH assumes that household has limitless life and consumes based on discounted wealth, laboured income and on the level of interest rates. Household will try to maximise the utility of consumption over lifetime period. He postulates that the timing of consumption is not determined by the timing of current income but rather by the marginal rate of substitution between this year's consumption and next year's consumption or the rate of interest rate. Interest rate is assumed to be exogenously given and not derived from any general equilibrium.

Savings can be shown as the summation between marginal propensity of saving of the permanent income and marginal propensity of saving from transitory income since saving is considered the residual between observed income and consumption:

$$S_t = \alpha + \beta Y_t^p + \gamma(Y_t - Y_t^p) + \varepsilon_t \quad \textbf{Equation 2.6}$$

$\beta$  is the marginal propensity to save (MPS) from the permanent income and  $\gamma$  is the MPS from the transitory income. The main basic assumption of PIH is that household will try to maintain the consumption level in its current form and any changes are reflected on the magnitude of the savings rate. In another words, Friedman (1957) postulates that household consumption will only respond to changes in permanent but not transitory income. Therefore, any fluctuation in consumption on top of the permanent consumption level is only temporary. Only if there is any increase in income perceived by the individual as permanent, the individual would then raise his or her consumption level permanently.

However, Carroll and Summers (1991) criticise the applicability of the model during the early 1970s economic slowdown. It is expected that before the slowdown, the consumers would have expected that

they will start saving earlier to smooth out their consumption due to lesser earning in the future.

However, it turns out that all of the aggregate saving in the developed countries before and during the 1970s oil crisis recorded a decline. This phenomenon contradicts the PIH, which stipulates that individuals would start saving in anticipation of less earning in the future in order to smoothen out their overall future consumption expenditure.

#### 2.2.2.2 Life Cycle Hypothesis (LCH)

LCH by Modigliani and Brumberg (1954) contend that individuals and household maximise lifetime utility by allocating lifetime discounted income to consumption in various periods of the life cycle to equalize with the discounted marginal utility of consumption in each period. The life-cycle model predicts that individuals should smooth consumption by holding marginal utility constant, across stages of life.

The amount of lifetime consumption is equal to the wealth plus the labour income throughout the remaining life of the household. In contrast to Keynesian model, the consumption is depended only on expectation of the lifetime income.

Consumption and income tend to fluctuate over the individual and household life cycle so it does not mean that the current income matches in proportion with the current consumption (Browning and Crossley, 2001; Tobin, 1967). The model predicts household will borrow before the young dependents enter working environment. Once these individuals start to work, they will begin accumulating wealth until upon reaching retirement age, when most their saving accumulated will be spent away. During the period where individuals earn more than they spend, they will save. In contrast when they earned lesser, they will support their consumption by saving less or borrowed elsewhere. The classical type of LCH is

that income will rise until the time of retirement. LCH also postulates that the main motive for saving is for retirement, as the individual became less productive and depended on accumulated savings.

The shape of the age profile of saving determines how the aggregate saving rate responds to changes in economic growth and demographic structure. In what Modigliani (1970) calls the “stripped-down” model, income is increasing until retirement and decreasing thereafter, while consumption is constant throughout life, so that there is positive saving until retirement, and negative saving (dissaving) from retirement until death. This negative association between age and the rate of saving implies that aggregate saving rate will be greater the higher is the rate of per capita economic growth. If income grows as a result of increased productivity, even if population remained stationary, saving will show positive because younger working population will generate more income and more savings from higher per capita income growth, than do the old generation who dissave but at a lesser rate.

Modigliani (1986) on ‘balanced population growth’ postulates that the major determinants of the saving rate (over time in a given country or across countries) are the rate of growth of per capita income and the age structure of the population. It is assumed that countries with greater rate of population growth with balanced age structure will experience greater number of people entering the working life, hence greater potential savers. Thus even if all the individual households in two given economies have the same saving profile over their life cycles, one economy may show a higher aggregate saving rate because it has faster population growth and /or faster economic growth from generation to generation. In another words, growth in income is assumed to occur across cohorts or generations rather than within cohorts. If earnings growth increased, the current generation would not experience increased in lifetime earnings. Only their successors will enjoy the shift towards higher lifetime earnings.

According to Modigliani (1986), when the growth is attributable to productivity, this phenomenon is termed as Bentzel effect. Similarly, an increase in per worker income from one period to the next implies that the working-cum-saving generation is wealthier than the preceding one. Even if the saving and dissaving individuals have the same saving propensities, the new generation will be saving out of a higher income than the dissaving one, which renders aggregate savings positive.

In the short term the aggregate savings will be influenced by transitory income earned on top of the average permanent income of the individual or household. Modigliani and Brumberg (1954) argue that the higher fraction of people on a temporary basis with high transitory income, the higher is the saving ratio. Hence, it explained why the farmers and small business enterprises tend to save more as their incomes are considered more unpredictable.

Demographers added to LCH by postulating that life cycle stage of dependency could adversely affect public and private savings. According to Mason (1988), if a decrease in the children caused increased in the overall life time earning, the aggregate saving will increase similarly. If a decrease in the number of children affects life cycle savings by transferring the childrearing period to the post childrearing period, aggregate saving will increase as long as the aggregate income is growing. Therefore changes in dependency ratio will affect aggregate saving in so much as depending on the rate of growth income.

Specifically, the link between working and non-working populations is significant as the nonworking population tend to reduce the national household saving, since they consume without generating sufficient earnings (Modigliani and Cao, 2004). If the population is growing and has reached its equilibrium, the proportion of working household will become significantly large, which leads to current life cycle savings to overtake current life cycle dissaving, thus aggregate savings will be positive.

Likewise, if the rate of growth of total income, i.e. the sum of rate of population growth and the rate of

per capita growth is zero, the aggregated savings will be offset by aggregated dissaving, hence the overall life cycle aggregated savings will then be zero. Modigliani (1986) did not expect interest rate to play a significant role in affecting savings. However, interest rate will have positive effect on savings if substitution effect is dominant, in which household would defer consumption to later period and save now. On the other hand, if most households are net depositors, an increased in interest rate will produce greater income. This phenomenon is called the income effect. Realizing that they can earn extra income, they would be encouraged to spend more. As a result their total expenditure will be more than their income and this would cause negative effect on their overall savings. They will become dissavers rather than savers. Modigliani (1986) postulates that there will be net overall savings with increase in the interest rate if the substitution effect is more dominant than income effect. He also argued that inflation is expected to cause certain amount of uncertainties in the economy. He expected the population would take the precautionary measures by increasing their savings to protect against the risk of losing their future purchasing power. Therefore, the higher is the expected inflation, the higher will be the savings rate.

Private savings is also affected by deficit. In a rational society where the individual consume service and goods, they would realize that the current deficit increases the countries debt which eventually would increase future interest rates and taxes. The household would start to save if they expect that the government will impose tax in the future to finance the deficit due to the current expenditure. The current saving would supplement the future income in order to maintain smooth consumption in the event the government initiate increase in taxes. The overall national savings won't be affected by the government dissavings (deficit) as it is offset by the private savings. Therefore, it is postulate that the future service of the debt is equal to the present value for the future taxes that will be levied by the current households and individuals.

### 2.2.3 Review of Evidence on Savings

Together with examining the savings and growth models, we review previous literature that empirically examined some variables used by these models to depict relationship with savings. The variables to be reviewed are demography, growth, government savings, interest rates, inflation, financial development and terms of trade. Furthermore, we would also use the same variables to empirically test savings behaviours on selected emerging economies. Finally, we would re-use the same variables as our control variables when we test empirically the relationship between institutional factors and savings in chapter 6.

#### 2.2.3.1 Demography Effect

James Tobin's (1967) published a study that national saving rate would increase with faster population growth. His reasoning was based on the premise that with faster population growth, there will be a greater increase in productive population group rather than the older population group, which resulted increased in income growth. Leff (1969) conducts extensive regression study on aggregate savings on 74 countries to determine the effect of demographic factors based on specific ages by controlling for log GDP per capita. He finds that aggregate savings were negatively related with the increase in youth dependency, i.e. below 15 years and old age dependency, i.e. ages 64 and above. However, Goldberger (1973) and Ram (1982) question the reliability of empirical work and cast doubt over the negative relationship between dependency periods against aggregate savings.

According to Fry and Mason (1982) on LCH, age structure is expected to interact with income growth in affecting the level of national savings. An increase in the number of young dependence will reduce the saving rate, *ceteris paribus*. At a greater rate of income growth, young families will have greater lifetime resources than middle-aged families, therefore the percentages of dissaving will be larger, and the

negative effects of additional children on the saving rate will become greater. He termed it as the interaction effect.

Mason (1988) postulates that there are three major factors that young dependency population can affect aggregate savings. First is the distribution effect as a result of the increase or decrease in the number of household occupants. The changes in the occupants will force redistribution of the consumable among the household members. He postulates that neither consumption nor rate of consumption is being affected. Second is on the level effect in which the increase in the household members will have direct effect on the overall current household consumption. Third is the timing effect in which the increased in the number of members will have intertemporal substitution, in which they would tend to increase current consumption in lieu of future consumption. These three factors would most likely have significant negative impact on savings.

Kelly and Schmidt (1996) improvise Leff's (1969) work and by expanding it into 89 countries divided into three distinct periods: 1960's, 1970s and 1980's. In the 1960's and 1970's the young and older dependency population did not show significant affect against aggregate savings, however, in 1980's both groups of population show significant negative relationship with savings. When the model is augmented by including the interaction between dependency and growth together, the result indicate a significant negative relationship against aggregate savings in the 1960s, 1970s and 1980s. However, when they expand to include only low income countries, only the income growth and young dependency population ratio shows any significant relationship with aggregate savings.

Higgins and Williamson (1996) conduct studies on 16 Asian countries from 1950 to 1992 by regressing demographic data against savings. They conclude that the economic prosperity experienced by these countries was reflected by the decline in the fertility rate, which helped to transform the age composition

of the population. It caused the population to generate greater working age population, which increased the aggregate savings and the economic growth rate.

Weill (1994) conducts microeconomic studies and his result indicates significant relationship between savings and demographic studies, however, he finds that old age people did not dissave when they retire. Carroll and Summer (1991) and Haque et al (1999) argue that elderly people may not dissave to the extent that the lifecycle model predicts due to bequest and unpredictable expenses by the elderly, in contrast to the assumption of life cycle model predicting that there will be major dissaving by the older population.

Shultz (2004) concludes that if the quantity and quality of children can be interchangeable, it could explain the negative relationship between fertility and savings. With the introduction of new technology on birth control, it would reduce the cost of birth control, which would lead to reduction in birth fertility. Hence, private savings would increase as youth dependent population shrank from lower birth rate.

Hondroyannis (2005) uses GMM estimator on 69 countries comprised of 20 industrial and 49 developing countries. His result indicates that urbanization ratio and the young and old dependency ratio have significantly negative impact on the savings rate.

Schrooten and Stephan (2005) examine the dependency impact on savings on the newly EU-accession countries. The result indicates a significant negative correlation between these variables, which concurs with LCH. In contrast with the result derived from EU member countries, they show insignificant relations between these variable, which leads to the conclusion on the state of public pension fund enjoyed by the Western European blocks. They attribute the insignificance relationship to the fact that the public pension fund inherent in the Western European counterpart provides a reasonable standard of income to support a comfortable standard of living.



Cook (2005) conducts studies on 120 countries to investigate the effect in increase of the population growth on savings. He finds that there is positive relationship between savings and the labor force, however, negatively related with young dependency population. The conclusion derived is that by curbing the birth rate growth it would eventually increase savings in the long run.

Li et al (2007) investigates the impact of life expectancy, population growth and population demography on savings, investment and per capita output growth across two hundred countries from 1960 to 2004. The studies discover that increase in life expectancy contributes positively towards the growth on savings, investments and income growth, and in contrast the aging population adversely affecting the savings, investments and income growth rate. Contrary, to study conducted previously by Modigliani and Cao (2004), the age group structure or specifically the dependency group didn't have any significant impact on savings

Utilizing a panel dynamic model for G7 countries from 1979 to 2001, Soyoung and Jong (2008) find that the demography affect, i.e. the change in population age structure have significant affect on private savings and government savings. The higher is the dependency rate the more negative affect it has on government savings than private savings.

#### 2.2.3.2 Growth Effect

Modigliani and Ando (1963) argue that higher income growth would increase aggregate saving, *ceteris paribus*, by virtue that the increase in income by those in productive stage would outweigh those in the old dependency. As a result from household aggregation, when the economy continuously grows, it is expected that the workers' savings will increase more in relation to the retirees' dissavings.

Carroll and Weil (1994) examine savings on 38 countries indicate that there is close relationship between growth and savings using Granger causality test. They find that high savings experienced by East Asian countries was caused by increased in income growth rates. In 2000, both also conducted studies on Asia region in examining the impact of savings through habit formation. They find that in the short run savings tend to increase but in the long term savings tend to decrease as the economy was growing. However, the result indicates that during the transition period to the steady state, long term savings tend to be on the rising trend. They also find out that there is an increased in intertemporal elasticity of substitution as interest rate increase as the consumer willing to postpone consumption as the rates increased.

Paxson (1996) using micro data on life-cycle models for each country indicates that the increase in economic growth will have a marginal effect on aggregate saving rate. Specifically, the results show that an increase in economic growth of 10 percentage points would increase the aggregate saving rate by no more than 2.5 percentage points (for the US and Taiwan), and would have virtually no effect on the saving rate in Britain or Thailand. She postulates that even though the saving rates resemble hump-shaped pattern, the reason the effect on savings were quite marginal due to income and consumption move together over the life cycle.

Masson et al (1998) examination on 21 developing and 40 developed countries find positive correlation between GDP growth and savings. However, they find negative correlation when the per capita incomes in the developing countries were being squared. This seemed to suggest that after a certain threshold of income, a further increase in aggregate income growth would have diminishing effect on savings.

Deaton and Paxson (1997) investigate the consequences of savings and inequality of population and economic growth on Unites States, United Kingdom, Taiwan and Thailand. The empirical results shows

that the increase in growth and population only contributed a small fraction of increase in the saving rates, therefore the life cycle effect of growth and population on saving is not large enough to justify a cross country effect

Deaton (2000) using the household samplings in Thailand and Taiwan finds that the greater is the income growth, the more negative impact it has on the overall household savings. The growth rate will contribute towards higher aggregate income, however, the extra income gained would instead be used for increase spending on household expenditure rather than savings.

Park and Rhee (2005) utilise micro study on Korea finds that aggregate saving can neither be explained by the increased in the relative size of population nor by the increased in the income of certain age groups. In contrast, the overall growth in aggregate saving was attributed to the universal rise in the saving rates across all age cohorts.

Modigliani and Cao (2004) show that by controlling the population growth rate in China, the government has changed the demographic structure of the population. It has caused increased in percentage working age group, therefore lowering the dependency age group, which eventually contributes to the increase in the savings.

According to Aghion et al (2006), savings are positively related to those countries classified far away from the technological frontier. In contrast, those countries that are considered closer to the technology frontier, their growth rates are not affected at all. The reason is that those countries that are far from technology frontier, the local banks would use domestic savings to finance foreign investor to spearhead new projects. The foreign investors would then introduce new technologies to the local entrepreneurs, who would then contribute to the growth of the economy. Hence, the greater the savings rate, the higher the growth of these countries. As compared to the countries that are closer to the technology frontier,

they would rather use local investors to spearhead projects rather than using foreign investors. There was no transfer of technology involved to spur the economy, which explains the indifference results between private savings and growth in developed economies.

The study on EU-accession economies also shows that per capita income is correlated positively with private savings, which meant that countries with high per capita income tend to have higher saving than those with lower per capita income. Further analysis shows that those countries in Eastern Europe and Baltic state have higher savings than those former Soviet Union (Chowdry, 2004).

Based on Schrooten and Stephan (2005) study on EU-accession and EU member countries, their result indicates that both regions show that per capita income is positively related to private savings. While the short run affect is similar for both groups of countries, but the long-run affect shows that per capita income in EU-accessions countries has larger impact on private savings than EU-member countries.

#### 2.2.3.3 Government Savings Effect

Ricardian hypothesis hinges on the premise that in anticipation of future taxation by the government as result of substantial current spending, private sectors would increase their savings rate for fear of diminishing purchasing power in the future from higher taxation. As a result, the intertemporal substitution between government spending and private spending would negate any fluctuation in the overall national savings. The increase in the government deficit as a result of lower taxes or higher government spending can boost private consumption and thus, a coefficient between 0 and  $-1$  is expected when government savings are regressed against private saving.

Barro (1974) rejects the Ricardian Equivalence hypothesis by claiming that government surpluses or deficits would not have any impact on the general savings.

Haque and Montiel (1989) reject Ricardian equivalence after sampling 16 developing economies and attributed the non-equivalence to the effect of liquidity constraint experienced by household savings.

Corbo and Schmidt-Hebbel (1991) studies on 13 developing countries find that for one percent increase in government savings resulted in minus 0.47 to minus 0.50 percent decline against private savings. It indicates that the government savings crowds out private savings.

Dalamagas (1992) presents empirical evidence from 52 countries and finds that in countries with low-debt ratio there is a positive relationship between consumption and government deficit which indicates that when deficit increases, savings also declines.

Edwards (1996) in the panel study on 36 developing economies finds that there is substitution between household and government saving, even though the substitubility is not one-to-one basis. Seater (1993) postulates that different government spending behaviour would yield different results against private spending. Increase in government spending may cause a decline in the availability of resources for private sector which causes negative effect on private savings. According to Seater (1993), public investment that is productive but does not require further taxes would not generate private savings response. However, increased in the government expenditure that causes increased in future taxes would result increased in private savings.

Based on the analysis on 150 countries from 1965-1994, Loayza (2000) finds a negative relationship between private and public saving rates in India, however the relationship is not a full Ricardian equivalent since the coefficient on the public saving ratio is statistically less than minus one. An increase in public savings by one percent lead to short term decrease by 0.29 percent and long term decrease by 0.69 percent of private savings. Schrooten and Stephan (2006) find that public sector savings have a Ricardian effect on private savings for EU-accession economies and EU members. The short run affect

was the same for both groups of countries, i.e. minus one percent, however, there were differences in the long run. The long-run effect on EU-accession economies was minus 0.5 and EU members was minus 0.9 percent

Chowdry (2004) using GMM estimation on transition economies reveals that the short-term and permanent coefficient is less than minus one when regressed against public savings, which indicates that the substitution affect is not unitary.

The study by Cohn and Kolluri (2003) supports Ricardian equivalence hypothesis that government saving partially substitute household savings. Real per capita government savings have shown statistically negative effect on all of the G-7 countries, except Canada.

#### 2.2.3.4 Real Interest Rate Effect

According to McKinnon (1973) and Shaw (1973), an increase in real interest rates in developing countries would encourage savings and increase the supply of credit available to domestic investors, which would help the economy to grow rapidly. Fry (1978, 1980) also finds a positive correlation between gross national savings and interest rates at five percent significant level if the deposit rate of interest is used as proxy and 10 percent significant level if the government bond is used instead. Studies by McDonald (1983) on Latin American regions find a positive significant relationship between savings and interest rates with the coefficient of 0.2.

Gupta (1984) studies on 12 Asian countries find that financial savings increase positively with the increase in interest rates. The positive correlation between interest rates and savings is due to the substitution affect. With the increase in interest rates, it will induce decrease in future consumption. Individuals would prefer to spend more on future consumption rather than the current consumption.

Rossi (1989) also finds that the increased in the real rate of return is not likely to elicit substantial increase in savings, especially in low-income developing countries. Balassa (1989) finds positive correlation between the interest rates and savings in developing economies but find it reduced when compared to developed countries.

Ogaki et al (1996) claim that interest rates affect on private savings was depended on the per capita income of a country. The interest rate would only significantly affect on those countries that reached certain per capita income threshold. They attribute the insignificant impact of interest rates on private savings on poor countries due to liquidity constraint.

Masson et al. (1998) reports positive correlation but finds it insignificant when subjected to a more robust test. It became clearer that when tested on the developing countries the effect be attributed to the choice of interest rate used as proxy and due to other affected variables such as financial liberalisation. However, Bandiera et al (2000) indicates that there was an ambiguity on the effect of interest rates on savings. Only when the countries were being pooled together, the results indicate a long-term positive effect on the correlation. Even then the affect is quite limited.

Loayza et al (2000), performing cross-country estimation on 69 countries, reveal that real interest rate has negative impact on private savings, with one percentage increase in real interest rate caused 0.25 percent increase in private savings in the short run. However, due to the negative correlation between interest rates and inflation, the negative correlation between savings and interest rate would be more attributed to controlling inflation rather than the income affect.

Hondroyannis and Papapetrou (2005) examination on 13 European economies using panel cointegration reveal significant positive relationship between interest rates and savings. By using VECM and VAR model on seven Asian developing countries, Agrawal (2001) analysis finds that the high

savings rates were mainly contributed by the high growth per capita income and population age structure rather than interest rates. In Malaysia and Singapore, he finds that government institutionalized retirement scheme played a major role in contributing towards the high growth in savings.

#### 2.2.3.5 Inflation Effect

Masson et al (1998) postulate that the effects of inflation rate on savings can be double sided, i.e. it can positively and negatively affects savings. Positively as inflation can act as precautionary motive and tax on saving, while negatively it can cause increases in resources to be allocated for consumption. They conducted cross sectional regression on a sample of 40 developing countries and find either insignificant or negative relationship with savings.

Hussein and Thirlwall (1999) panel result between savings and inflation on 55 countries shows positive but nonlinear relationship. Inflation is perceived as tax on money as savers would increase the level of savings in anticipation of its increase as they would like to maintain their real level of wealth. When the inflation is subjected to robust test, the result shows that the inflation is still positively related to savings.

Loayza et al (2000) find that by increasing the inflation rate by 10 percent, it will increase the private saving by one percent. He attributes the phenomenon to the precautionary effect. As people become more uncertain about their future, they will allocate more of their income into savings.

Inflation, which is a proxy for macroeconomic uncertainty shows significant positive effect on private saving, which suggest, individuals prefer to save a larger fraction of their income for precautionary motives during period of uncertainty. (Loayza et al, 2000; and Hondroyiannis et al, 2005).

The generalized methods of moment (GMM) estimation result on EU-transition economies shows that the inflation has a positive effect on savings (Chowdry, 2004). With an increase of inflation by 10



percent, it would raise savings by 0.8 percent. The result indicates that with the increase in uncertainty, it would induce the people to less consume, hence increased in savings.

#### 2.2.3.6 Terms of Trade Effect

According to Svenson and Razin (1983), Harberger–Laursen–Metzler model in 1950 postulate that there is a significant impact from terms-of-trade shock on saving due to the consumption smoothing affect. A negative transitory shock will lead to decline in transitory income which is larger than decline in permanent income. Consumption smoothing behaviour would then lead to a decline in domestic savings. On the other hand, a permanent decrease in terms of trade, which would have simultaneous decrease in current and permanent income, would not have any impact on savings.

Masson et al (1998) study on 61 countries reveals that terms of trade have positive impact on industrial countries, but negative affect for developing countries.

Matsubayashi (2002) empirical result using GMM method indicates that the intertemporal substitution between terms of trade and private savings is more than one for Japan and United States. This indicates that the improvement in the country terms of trades causes decline in private savings.

Cashin and Dermont (2003) extend the impact of the transitory term-of-trade shock on private saving on five industrial countries using an intertemporal model of consumption. The model hinges on the assumption that substitution effect will influence private savings decision. This substitution effect relates to the country's economic elasticity in response to the term-of trade shocks: i) either to choose to consume importables or non-tradables (intratemporal substitution), and ii) either to choose to consume now or in the future (intertemporal substitutions). The empirical indicates that the transitory

intratemporal substitution and intertemporal substitution have a significant negative effect on private savings.

Agenor and Aizenman (2004) examine the terms of trade in non-oil commodity exporters of sub-Saharan Africa for the period 1980–1996. They conclude if there were permanent increase in terms of trade, it would have a favourable positive impact on savings, however, if there were permanent decrease, it won't have any impact at all savings.

The study by Cohn and Kolluri (2003) supports Ricardian equivalence hypothesis that government saving partially substitute household savings. Real per capita government savings have shown statistically negative effect on all of the G-7 countries except Canada.

Chowdry (2004) investigates 21 transition economies using GMM method and finds that both permanent as well as transitory terms of trade have significant positive impact on private savings. However, the transitory component has a greater positive impact on the permanent ones, which shows lack of access to borrow externally by these countries.

#### 2.2.3.7 Financial Development Effect

The growth of financial development can not only help for the individuals to access funding but also enable them to easily deposit or invest their money. The integrity and credibility of the financial institutions and system would help to gain the customers confidence to engage in the financial transaction. The risk of financial meltdown or increase in negative news concerning the financial system could cause them to withdraw their money or not borrowing from the institutions.

Beck et al (2000) examine 63 countries from 1960 to 1995 using panel cross section and Generalized Method of Moment (GMM) to find the relationship between financial development and savings. They

use several ratios as proxy for financial development and the result was considered mix. Different econometric techniques yield different results and the conclusion is there was no robust or consistent relationship able to link between financial development and private savings across the 63 countries.

Loayza and Shakar (2000) find that credit to the private sector over GDP in India has a negative effect on private savings. The underlying reason was the deepening of financial sector enable individuals to finance higher ticket items at the current level of income by borrowing. The individuals need not have to save considerably in order to buy expansive products, which explain the negative relationship between savings and financial development.

Cook (2003) tests using different variables as proxies for financial development based on the levels of liquidity. By testing on 122 countries and utilizing oil exporting countries as dummy variables, the results indicate that all of the proxy variables have positive effect on savings at different levels of significance. Athukorala and Sen (2004) results show that the greater is the level of financial development in India with the increase in the number of bank branches, the greater are the savings.

Kelly and Mavrota (2003) conducts panel integration and cointegration test on 17 African countries by using several measures of financial development against private savings. Their results indicate the significant positive relationship between financial development and private savings are only apparent in a few countries. The inconclusive results meant that the recent financial reforms are not able to achieve the expected results to increase savings.

Menzie and Ito (2007) find that the deeper is the financial development, the less impact it has on national savings for countries with well developed legal system and open financial market. Vice-versa, the deeper is the financial development, the greater the impact it has on national savings for countries with lesser developed legal system and closed financial market. They postulate that there will be considerable

increase in investment in emerging economies with improved financial development as well as better legal system and greater open market. Bernanke (2005) postulate that the more financially developed is the emerging markets, the lesser will be the accumulated savings.

## **2.3 GROWTH THEORIES AND EVIDENCE**

### **2.3.1 Neo Classical Growth - Solow-Swan Model**

Policies that encourage savings are deemed important as higher savings will contribute to higher economic growth. We would like to revisit neoclassical growth model by Solow (1956) and Swan (1956) to establish the theoretical link between savings and growth. The Solow-Swan model is based on simplification that the savings rate is constant and determined exogenously.

The Solow-Swan production function model of long-run economic growth describes how the input and output are related in the economy as well as how capital is accumulated. In particular, the Solow-Swan model shows that an increase in the stock of capital leads to a higher level of output and faster growth at least in the short to medium term.

This function model expresses how much output can be produced, given the aggregate capital stock ( $K$ ), knowledge, technology, and a given array of different capital, intermediate and consumption goods. It is assumed that all capital and labour are fully and efficiently employed, so  $f(K)$  is not only what can be produced but also what will be produced.

The model is based on the assumption that the capital is homogenous and certain fraction of the stocks depreciate and unuseable for production purposes. The production function assumed Cobb-Douglas model with constant returns to scale in capital ( $K_t$ ) and labour ( $L_t$ ); that is doubling the inputs,  $K_t$  and  $L_t$ , leads to double the output,  $Y_t$ , i.e.

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha} \quad \text{Equation 2.7}$$

where  $A_t$  is an exogenous productivity variable and  $0 < \alpha < 1$  is the income share of capital. The production function has diminishing returns in capital (labour); that by doubling capital (or labour), it increases output by less than double. Because domestic savings must equal domestic investment in a closed economy, capital accumulation is given by

$$K_{t+1} - K_t = sY_t - \delta K_t \quad \text{Equation 2.8}$$

where  $sY_t$  denotes private savings (i.e. savings is a fixed fraction  $s$  of current income  $Y_t$ ) and  $\delta$  is the rate of depreciation.

The model also assumes that aggregate savings finance the accumulation of the capital. Economies starting with low capital-labour ratio will have high marginal product of capital  $f'(k)$ . When capital is low, income to capital ratio will be large, which motivates people to save; this in turn compensate the depreciation from the existing capital.

The growth drivers in this model are exogenous technological change and labour force expansion.

Productivity is assumed to grow at a constant rate  $g$

$$A_{t+1} = (1 + g)A_t \quad \text{Equation 2.9}$$

and the labour force, which equals population, grows at rate  $n$ ;  $L_{t+1} = (1 + n)L_t$

The amount of increase in capital stock in any point of time can be determine from the differences in the gross investment in new capital generated from the fractions of earnings saved by the individuals against the depreciation of the capital stock and increase in population. The rate of which savings contribute to  $K$  can be denoted as the rate of savings per person  $s(\cdot)$  shown in equation 2.11.

Because productivity and the labour force are growing, the steady states will not be stationary and output will grow. Equation 2.8 is normalised by dividing it by  $A_t L_t$ , in order to express it in stationary steady state, as shown in equation 2.10.

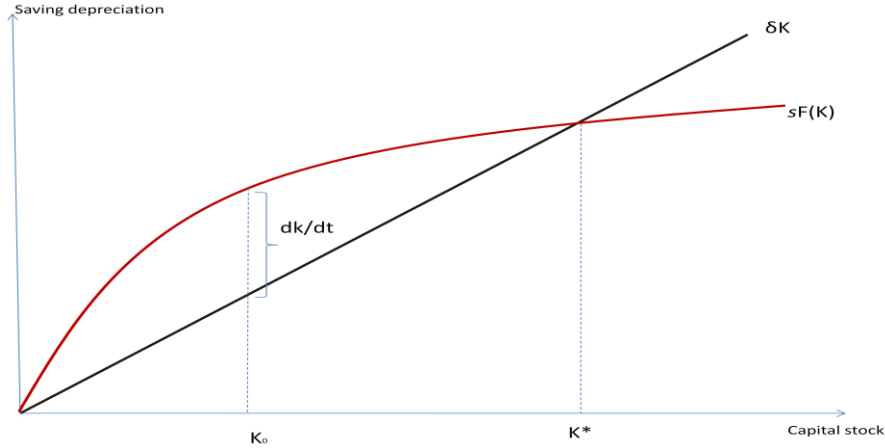
$$\frac{K_{t+1}}{A_t L_t} - \frac{K_t}{A_t L_t} = \frac{sY_t}{A_t L_t} - \frac{dK_t}{A_t L_t} \quad \text{Equation 2.10}$$

or

$$\dot{k} = s \cdot f(k) - (n + \delta) \cdot k \quad , \quad \text{Equation 2.11}$$

Equation 2.11 is the basic differential equation of the Solow-Swan model. This nonlinear equation depended on  $k$ . The term  $n + \delta$  can be treated as the effective depreciation rate for the capital-labour ratio,  $k \equiv K/L$ . If the savings rate reduced to zero, the capital per person would decline due to depreciation of capital at the rate  $\delta$  and also due to increase in the population at rate  $(n)$ . Increase in the rate of population growth tend to lessen capital per capita by diluting the capital resulting from increase population sharing limited sum of capital.

Based on figure 2.1, the rate of increase in capital stock can be depicted by the vertical line between the saving line and depreciation line,  $dk/dt$ . As long as the saving line position above the depreciation line, it indicates that the capital stock will be increasing monotonically and would converge at  $K^*$ , which is considered the stationary state of the economy.



**FIGURE 2.1**

The differential equation, i.e. equation 2.11, indicates how the change of capital stock is determined by the existence capital, which leads to the determination of the entire path of capital. As a result of  $\dot{k}$  or marginal product of capital is increasing with diminishing return, the saving schedule also indicate positive but with diminishing slope also.

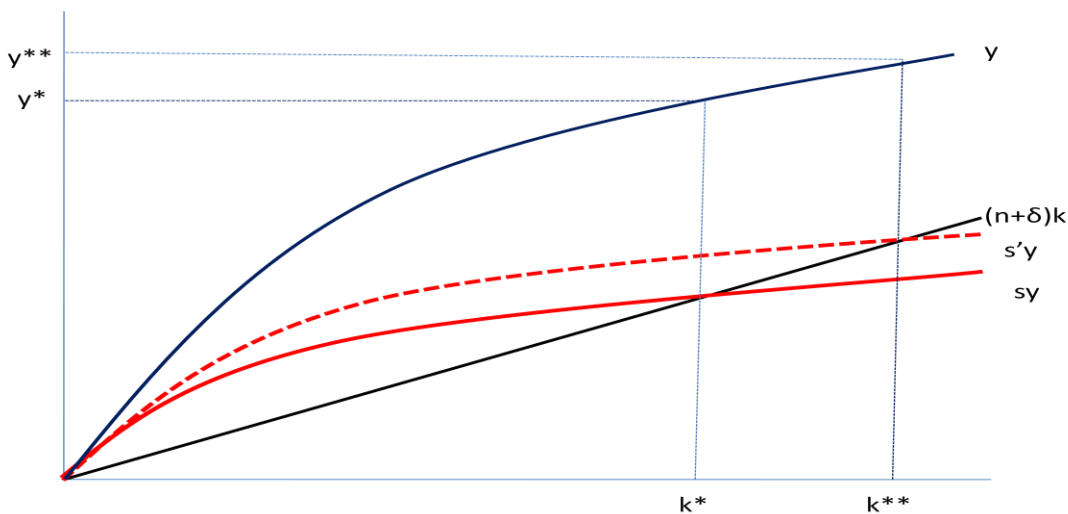
Thus the capital stock will rise, and hence national income  $F(K)$  will rise. But because of diminishing returns, national income will not grow as fast as the capital stock, which meant that savings will not grow as fast as depreciation. Eventually depreciation will catch up with savings, and at that juncture the capital stock will stop rising. The savings generated by the income gained from the new capital will also declined, and will eventually be only enough to replace worn-out machines and equipped new workers. At this point the economy enters a stationary state with unchanging standard of living. The diminishing return can be depicted with the following equation.  $F'(K) > 0$  and  $F''(K) < 0$  for all  $K$ , and imposing the Inada condition

$$\lim_{K \rightarrow 0} F'(K) = \infty, \text{ and } \lim_{K \rightarrow \infty} F'(K) = 0$$

The convergence point of the steady state can be depicted as follows:  $s \cdot k = (n + \delta) k$ . But if the marginal product continues to fall, the savings generated by the income accruing to new capital also will fall, and

will eventually be only just sufficient to replace worn-out machines and equip new workers. At this point, the economy enters a stationary state with unchanging standard of living.

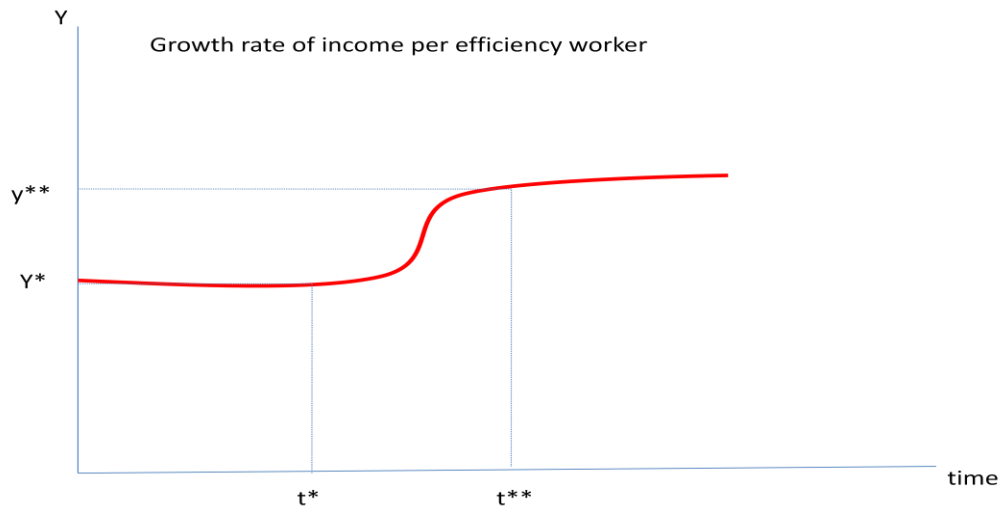
The link between saving, capital and output can be illustrated clearly in Figure 2.2. Figure 2.2 plots the production function,  $y$ , the saving function,  $sy$ , and savings needed to maintain any given level of capital,  $((1+n)(1+g) + \delta)k$ , all as a function of capital per efficiency worker,  $k$ . The savings function and savings needed to maintain a given level of capital intersect at the long-run equilibrium, steady state, where capital accumulation is zero, point  $(k^*, y^*)$ .



**FIGURE 2.2**

The Figure 2.2 can be used depict how savings influence the economy. The increase of savings from  $s$  to  $s'$  caused increased in capital per efficiency worker from  $k^*$  to  $k^{**}$  as well as gross income per efficiency from  $y^*$  to  $y^{**}$ . However, once the economy reached to its new capital level, income per efficiency then continues its former growth rate. This can be shown from Figure 2.3, which shows income per worker overtime.





**Figure 2.3**

In essence, prior to increase in savings, the income growth rate is equal to the labour efficiency rate and the ratio of income over efficiency labour is constant. The rise in saving would lead the rise in capital stock,  $k^*$  to  $k^{**}$  and income,  $y^*$  to  $y^{**}$ . In order to move to higher equilibrium stock  $k^*$ , the capital must grow faster for quite some time than efficiency labour. Due to greater increase in capital stock, the income will grow temporarily faster than efficiency labour.

The rise in savings would temporarily increase the capital stock, however, would not have any long-run effect on growth rate. A rise in the depreciation rate would cause decline in the capital by moving the depreciation schedule upward. However, once the new steady state ( $k^{**}$ ,  $y^{**}$ ) is reached, capital and income will grow again at the same rate as efficiency labour, i.e.  $y^{**}$  is constant. This implies that a country willing to invest more of its output (and consume less) can enjoy a temporary growth spurt; however, increased savings will not raise growth indefinitely. In this steady state equilibrium, output and the capital stock will both continue to grow but only at the rate of population growth. Growth as measured by the rate of increase in output per person will cease in the long run.

Without population growth and increase in technology, the economy will eventually reach a stationary level its growth rate experience diminishing return. As capital stock reaches the stationary level  $k^*$ , gross income will reach its stationary level,  $y^*=f(k^*)$  and the growth rate of national output will fall to zero.

Mankiw, Romer and Weil (1992) agrees with a standard Solow model on international difference in levels of per capita income and rates of growth after they factored in to include human capital and to allow for cross-country differences in savings rates to reflect differences in tastes or culture. The assumption was based on that every country has its own Cobb-Douglas aggregate production function and its own exogenous rates of savings and population growth. In the Solow growth model, this would imply convergence to different steady-state path for per capita income, as represented in equation 2.12:

$$\ln y_t(t) = \ln A_i + g_i t + \frac{\alpha_i}{1-\alpha_i} \ln s_i - \frac{\alpha_i}{1-\alpha_i} \ln(n_i + g_i + \delta_i) \quad \text{Equation 2.12}$$

Here,  $y_i(t)$  is per capita income in a country  $i$  at time  $t$  (when the country has already entered a steady state with constant growth rate  $g_i$ ,  $A_i$  represents a multiplicative factor in the aggregate production function that augments the productivity of labour at time 0,  $\alpha_i$  denote the exponent on capital in this same production function (and also capitals's share of income),  $s_i$  is the country's saving rate and  $n_i$ ,  $g_i$  and  $\delta_i$  are the rates of population growth, labour-augmenting technological progress, and capital depreciation, respectively.

The equation states that a country per capita income in the steady state is positively related to the initial workers productivity, technology progress, and interest rates. However, it is inversely related to the rates of depreciation and population growth. A high savings rate indicates that most are used to replace depreciated capital, while low depreciation and population growth rates mean that little of the new capital must be used to replace old machine or to equip new workers. Hence, savings will only affect the

growth rate temporarily according to Solow-Swan. In another words, increased in savings would increase capital-output ratio, raises output and capital per head, but unable to change the steady state of growth.

### 2.3.2 Growth and Financial Development

Two major factors are significant when discussing theories about savings. One is financial development and the other is growth. The study into financial development-growth nexus can be classified into two perspectives. One can be viewed as an important agent to ensure that the financial transaction could be done efficiently and effectively. The other one views the role of financial liberalisation in terms of growth and financial deepening.

#### 2.3.2.1 Financial Development Model

The first school of thought is based on Diamond (1984) model, i.e. financial institutions help to share and diversify risk in financial market. The study focuses on delegated monitoring by financial intermediaries. Depositor delegates the role of monitoring to the financial intermediaries in overseeing the lending to the entrepreneurs. Diversification occurs when  $N$  bankers working for intermediaries monitor ex-ante information of  $N$  entrepreneurs. The bankers are assumed not to face any moral hazard since all bankers observe each other information. Due to the risk sharing, each bankers signalling decision is equivalent to that of a single entrepreneur signalling a project with a mean cost of  $N\mu/N=\mu$  and variance  $(1/N)^2 N\alpha^2 = \alpha^2/N$  (where  $\alpha =$  constant). As a result, diversification by subdividing risks, the intermediary's signalling costs are lower than an entrepreneur's and the intermediary's costs are equivalent to the signalling costs of an entrepreneur with a smaller variance of specific risk.

Diamond and Dybvig (1983) focus on the financial institution's ability to pool and mitigate risk and invest in projects that are considered long-term in nature. These projects are deemed too illiquid, that is

beyond the capability for the individuals to handle, but yet able to generate handsome return. This makes the role of financial institutions unique as they improve investment efficiency and eventually enhances economic growth (Becievenga and Smith, 1991). Becievenga and Smith (1997) continue further work by Diamond and Dybvig (1983) by formulating models that illustrates financial development create specialisation in financial markets. According to the model, there are costs incurred in establishing the market. These costs are more affordable for societies on high levels of per capita income than those at the lower levels. Increased revenue from transactions taking place in the financial market would be able to lessen the average cost of transactions. Hence, based on the model there would be specialisations in the marketplace as more transactions occur and increased productivity.

Based on the model developed by Greenwood and Jovanovic (1990), financial institutions are expected to increase the percentage of investments and hence the economic growth. In its early development, the economy is simple and poorly organised. Information regarding the range of productive activities is expected to be dismal. The role of financial information becomes vital to act as monitoring agents, pooling all the important information regarding information activities, and giving professional advice on any potential productive venture. Hence, financial intermediaries act as vital role in transferring funds from unproductive investment to productive ones.

Financial institutions also increased the amount of savings transformed into investment based on endogenous growth theory (Pagano, 1993). It enabled pooling of individual funds and invested them in viable projects. The premise of Pagano's assertion is that as financial transactions increase, it would increase competition among financial institutions. Inevitably, that would help reduce leakages in investment caused by previous high transaction fees imposed by financial institutions. In addition, with increased activities of financial institutions, it will be able to stimulate the countries growth.

Pagano's assumption on the importance of financial development effect on growth was based on the AK model. The production function is assumed to be a function of capital and increasing function of the degree of financial development of the economy. Financial development affects the aggregate output by increasing the marginal product of capital.

$$Y_t = AK_t \quad \text{Equation 2.13}$$

$A$  = the marginal productivity of capital

$K$ = measure of physical capital stock

$Y$ = the output

Assume that the population is stationary that that there is only a single good is produced and consumed at it depreciates at the rate of  $\delta$  per period. Therefore, gross investment can be represented as follows:

$$I_t = K_{t+1} - (1 - \delta)K_t \quad \text{Equation 2.14}$$

In a closed economy in a steady state, gross savings  $S_t$  equals to gross Investment  $I_t$ . However, according to Pagano (1993), a proportion of  $(1 - \theta)$  is lost in the process of financial intermediation, in which a dollars saved by households generates less than one dollar worth of investment.

$$\theta_t = I_t/S_t \quad \text{Equation 2.15}$$

The leakages goes to the banks as the spread between lending and borrowing rates and to securities brokers and dealers as commissions.

Using the equation 2.13, the growth rate at time  $t + 1$  can be defined as

$$g_{t+1} = (Y_{t+1} - Y_t)/Y_t = (K_{t+1} - K_t)/K_t \quad \text{Equation 2.16}$$

Equation 2.14 is being rearranged into:  $K_{t+1} = I_t + (1 - \delta)K_t$  and combine with equation 2.16 into:

$$g_{t+1} = \frac{(I_t + K_t - \delta K_t - K_t)}{K_t} = \frac{(I_t - \delta K_t)}{K_t} = \frac{I_t}{K_t} - \delta \quad \text{Equation 2.17}$$

Equation 2.13 is then rearranged into:  $K_t = \frac{Y_t}{A}$  and then inserted into equation 2.17 and obtain:

$$g_{t+1} = A(I_t / Y_t) - \delta \quad \text{Equation 2.18}$$

By combining equation 2.15 into equation 2.18, the growth rate can be written as a follows:

$$g_{t+1} = A\theta(S_t / Y) - \delta \quad \text{Equation 2.19}$$

Assuming that  $s = \frac{S}{Y}$ , equation 2.19 can be summed up as:

$$g_{t+1} = A\theta s - \delta \quad \text{Equation 2.20}$$

Equation 2.20 is in a steady state where growth rate is a factor of marginal productivity of capital, ratio of savings turn into investment and savings rates minus rates of depreciation.

$g$  can then be rewritten into log form as follows:

$$\text{Log } g = \ln \theta + A + \ln S \quad \text{Equation 2.21}$$

In this equation, endogenous economic growth is affected by the three elements which is  $\theta$  which is the proportion of savings that transformed into investments or capital absorption rate,  $A$  which is the increase in capital productivity, which according to Lucas (1988) capital comprised of human and physical capital, and  $s$  the rate of savings.

From this context, financial development affects growth via increasing  $\theta$  or the capital absorption rate, or it may increase the social productivity of capital ( $A$ ); or it may influence the savings rate.

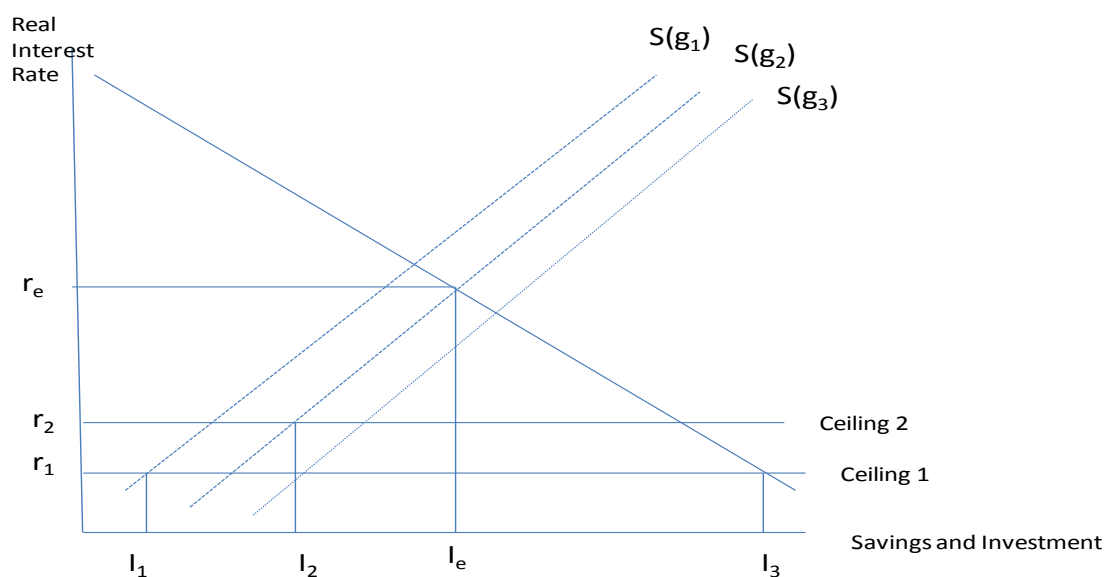
### 2.3.2.2 McKinnon-Shaw Financial Liberalisation Model

Mc Kinnon (1973) and Shaw (1973) show that financial repression exerts a negative effect on savings and economic growth. This condition occurs when the governments impose interest rates ceiling the deposits and loans. Financial repression causes disequilibrium, which distorts the market from clearing and serving the allocative function in the most efficient way. Both postulate that removing interest rate ceiling would allow the interest rate to be determined by the market forces and would in turn spur investment and growth. Figure 2.4 shows the impact of interest rates ceilings on savings and investment.

The premise of the model is:

- i. Investment ( $I$ ) is negatively influenced by real rate of interest ( $r$ )
- ii. Savings( $s$ ) is positively influenced by  $r$  with
- iii. Rate of growth ( $g$ ) is positively influenced by  $r$

Where  $S(g)$ = rate of savings;  $g$ = economic growth



Mc Kinnon –Shaw Hypothesis

## FIGURE 2.4

If  $g_1$  increase to  $g_2$ , it would caused increased from  $S(g_1)$  to  $S(g_2)$ . In a non-interference control market where the interest rate is free to fluctuate, the equilibrium would be at  $I_e$  when  $r_e = I = S(g_2)$ .

In a closed and financial repressive economy, the government would imposed interest rate ceilings by fixing real interest rate  $r_2$  lower than  $r_e$ , which is the equilibrium rate. At  $r_1$ , which is equivalent to the amount of interest that could earn from depositing money, the amount of money in the economy is equivalent to  $I_1$ . In this situation, the amount of money demanded ( $I_3$ ) is greater the fund available ( $I_1$ ), hence there will be shortages of funds available for investments. Depositors are not keen to save in low yielding interest rate and they would invest elsewhere to realise their expected returns. There will be credit rationing since there is excess demand for credit ( $I_3 - I_1$ ). There will be several potential profitable projects that will fail to obtain the necessary funds for investments. Several scenarios exist in this circumstance. Firstly, there is tendency for the population to consume now rather than deferring to later. Secondly, there will be lesser transactions as depositors would shy away from putting their money into low yielding deposits. Thirdly, investors would invest more on capital intensive projects rather than labour intensive projects as they could acquire funds for capital at a lower interest rate. Fourthly, investors could afford to venture into low yielding projects, which would be otherwise impossible in the market determined interest rate. Fifth, it also contributed misallocation of funds as the government tends to distribute available funds to preferred sectors rather than to those that can best utilise the funds. The result is inefficient usage of funds, which then contributed to slow economic growth.

McKinnon (1973) and Shaw (1973) postulate that by liberalising (or removing the ceiling on) the interest rates, it would remove inefficiency in allocation of funds and will increase the aggregate savings, investment and economic growth.



Assume that the government decides to allow interest to determine its course, and evidently the interest rate increases to  $(r_2)$  (Figure 2.4). Savings/Investment would rise to  $I_2$  and growth would be at  $g_2$ . Projects that yield returns that are higher than  $r_1$  but lower than  $r_2$  would no longer be acceptable to receive the fund. In this circumstance by relaxing the interest rates, it would encourage savings, increased efficiency in investment and reduce credit rationing. Eventually the interest rate would then move to the equilibrium point,  $I_e$ , and the economy would grow from  $g_2$  to  $g_3$ . Finally, there will be no more credit rationing or shortages of funds. Only potential projects with yields greater than  $r_e$  are acceptable for the needed funding.

### 2.3.2.3 Empirical evidence on Financial Development and Growth

Demetriades and Hussein (1996) conduct studies on 16 selected countries with each having 27 continuous observations using a time-series error correction estimation technique. Their study produces mixed result as some countries show significant relationship while others failed. Even the results from their error correction model are mixed, as some countries indicate positive causation running from financial development to economic growth, while the rest either indicates reversed or bidirectional causation.

Neusser and Kugler (1997)'s finance-growth study is based on time-series perspective on thirty sectors in fourteen OECD economies from 1960s to 1990s. The primary focus is to discover any causality between manufacturing sector GDP and financial sector GDP as well as between total factor productivity (TFP) and financial sector GDP. Most countries reveal long term relationship between manufacturing GDP as well as TFP with financial sector GDP. In terms of causality, it is unidirectional as the result indicates that financial sector GDP drives both TFP and manufacturing GDP in most countries. In certain countries, the causality is reversed.

Levine and Zervos (1998) use GMM dynamic panel estimation technique to deal with biasness caused by simultaneity bias, omitted variable and unobserved country specific effects to examine whether component of financial intermediary development influences economic growth. The study also uses cross-sectional method for comparison. Legal origin dummy variables introduced by La Porta et al (1998) were used as instrumental variables to control for simultaneity bias. The study involves 74 countries from 1960-1995. The result from both estimators indicates that financial development leads and influences the economic growth. The importance of this study is that it is able to allay any doubts regarding any biasness due to simultaneity or lacks of conditioning variables that have plagued previous studies.

Rajan and Zingales (1998) postulate that financial development is a leading indicator to anticipate faster economic growth. They use United States as a benchmark for frictionless financial market and assumed every sector of the industry requires external financing. Then they compare the industrial sectors across various countries and examine if these sectors that depended on external financing grew faster in those countries with well developed financial sectors. Their result indicates that external financing contribute more growth to the sectors with well developed financial sector than those that are less developed. In the nutshell, they conclude deepening of financial sector helps to alleviate the external cost of financing and therefore foster economic growth. Their end result confirms that causality runs from financial development to economic growth.

Levine and Zervos (1998) evaluate whether banking and stock market indicators are both robustly correlated with current and future rates of economic growth, capital accumulation, and productivity growth on 47 countries from 1976 to 1993. The study used cross-sectional analysis to find the relationship. The results indicate that that stock market liquidity is positively and significantly correlated with current and future economic growth, capital accumulation and productivity growth. Furthermore,

the level of banking development, as measured by bank loans to private enterprises divided by GDP, also shows similar significant result. Stock market size, volatility and integration with world capital markets, however, were not significantly correlated with economic growth and productivity increase.

Luintel and Khan (1999) use multivariate time series causality testing to examine the association between financial development and economic growth for 10 selected countries. Results show that there was bi-directional causality between financial development and economic growth in all the sample countries analysed, unlike the previous studies using bivariate testing, i.e. (Demetriades and Hussain 1996), which reported mixed results for different countries. Their results also shows that in the long-run, financial depth is positively and significantly affected by the levels of per capita, real income and the real interest rate.

Beck et al (2000) conduct a study of 63 countries examining the correlation between financial intermediary development and sources of growth, identified as (1) private savings rate (ii) capital accumulation (iii) total factor productivity. The studies apply the same two econometric procedures used by Levin et al (1998), namely GMM dynamic panel estimator to deal with simultaneity bias and country specific effect and cross-sectional estimation method. The results do not show any significant link between private savings rate and capital accumulation and financial intermediary development. However, it indicates a robust link between total factor productivity and financial development, in which can be construed that financial intermediaries affects economic development, mainly via influencing total factor productivity growth.

Benhabib and Spiegel (2000) use two models by regressing using GMM estimator to examine the financial development variables used by Levine (1998) against growth variables, i.e. total factor productivity, physical capital and human capital variables. One of the models used was neoclassical

model, based on Solow growth model with human capital added as factor production and the other, the endogenous growth model developed by Benhabib and Spiegel (2000). Each model was run with and without fixed effect. Overall, the financial development positively influences total factor productivity and investment variables, however, different financial development variables correlate significantly with different growth variables.

Thangavelu and Ang (2000) conduct using time-series VAR model and Granger test examining the causal relationship between financial development and economic growth in Australia, in terms of bank based versus market based system. The result indicates that economic growth spurs the growth of financial intermediaries, while in contrast, stock market growth leads the economic growth. It assumes that better functioning stock market, results better informed investment decisions and thus improved economic growth.

Wachtel (2001) using panel VAR on 47 countries for two eight-year average finds significant causality from financial development to real GDP but no reverse causality. He finds that by increasing money supply M3 by 10 percent, it would increase output per capita growth by 0.8 percent.

Time series method using Eagle-Granger causality test used by Mazur and Alexander (2001) in examining financial development relationship, i.e. stock market and bank sectors, shows negative correlation with economic growth in New Zealand.

Schich and Pelgrin (2002) use dynamic panel error correction approach to examine the correlation between financial development and the levels of investment in 19 OECD countries from 1970 to 1997. All the estimators show significant relationship between the financial development indicator, i.e. financial intermediary and stock market capitalization, against the levels of investment.

Guiso et al (2002) examine the individual regions of Italy. Using an extraordinary dataset on households and financial services across Italy, they examine the effects of differences in local financial development on economic activity across the regions of Italy. They find that local financial development (i) enhances the probability that an individual starts a business, (ii) increases industrial competition, and (iii) promotes the growth of firms. These results are weaker for larger firms as they can raise funds easier from outside rather than dependant from the local area.

Beck (2003) examines whether a higher level of financial development translates into a comparative advantage in industries that relies heavily on external finance as a source of financing. The study was conducted on 56 countries and 36 industries. It uses the same methodology as Rajan and Zingales (1998) by regressing export and trades shares with financial development across countries and by controlling simultaneity bias. The result indicates that countries, in which the industries rely more on external finance as a source of capital, with a higher level of financial development leads to higher export shares and trade balances.

Jeong and et al (2003) investigate to find relationship between banking health and economic performance. Their study was based on the US banking data stretching from 1942 until 1996. Variables used are bank capital (BC), investment oriented bank loans (IOBL) and GDP. Their cointegration test shows cointegration between BC, IOBL and GDP. However, that causality test shows bidirectional effect between BC and IOBL and weak exogeneity between IOBL and GDP.

Christopoulos and Tsionas (2004) examine the relationship between financial deepening and economic growth using Johansen and panel cointegration analysis on 10 less developed countries from 1970 until 2000. Vector error correction model (VECM) is used to determine the causality between the variables and ancillary variables (investment share and inflation). The result indicates that there is long run

relationship running from financial developed towards economic growth. There is no indication of bidirectional causality or short run relationship.

Rioja and Valev (2004) examine the effect of levels of financial development on economic growth by segregating 74 countries into 3 different levels of financial deepening, i.e. low region, middle region and high region. They employ GMM dynamic panel estimator, instrument variables and dummy variables to deal with serial correlation, country and time specific affects. Results indicate that in lower region the positive effect of finance and growth cannot be established. However, for middle and upper region, the finance-growth relationship is robust in which the authors suggest that it is imperative that to bolster economic growth it is essential for countries to develop to a certain threshold of financial development.

Levine and Beck (2004) study on stocks market, banks and growth is an extension of the study done by Levin and Zervos (1998). The methodology they use is a two-step GMM dynamic estimator applied on 40 countries. The data is averaged over five 5-year periods between 1976 and 1998 to normalise the business cycle influences. The result indicates that stock market liquidity and bank development significantly affect economic growth.

Hondroyannis et al (2005) assess the relationship between the development of banking systems and stock market against economic performance for Greece from 1986 to 1999. The result is less robust suggesting that the stock market capitalization and bank credit only partially determine the size of economic activity. Furthermore, the contribution of stock market to the growth process is substantially smaller than the banking sector, meaning that the stock market plays a lesser important role than the banking sector in contributing towards the growth of Greek economy.

Ghirmay (2005) investigates the linkage between financial development and economic growth on 13 sub-Saharan African countries using Johansen cointegration methodology and error correction model. The

result from the cointegration finds that there is long run relationship between financial development with economic growth in all the 13 countries. Eight of the countries show a causal relationship from financial development to growth, while nine countries show causal relationship from growth to financial development. Six countries show bidirectional causal relationship which results are similar to Luintel and Khan (1999).

Loayza and Ranciere (2005) study used Pooled Mean Group (PMG) estimator developed by Pesaran et al (1999) to analyse the long run and short run impact of financial development against growth on 75 countries from 1960 to 2000. Their result shows a positive long-run relationship between financial intermediaries and output, however, it indicates a negative relationship in the short run term.

Apergis et al (2007) investigate the long run relationship between financial development and economic growth using panel cointegration technique developed by Pedroni (1999) and PMG developed by Pesaran et al (1999) on 15 OECD and 50 non OECD countries from 1975 to 2000. The results indicate that there is long run equilibrium relationship between financial deepening and economic growth. They also find that there is bidirectional causality effect between financial deepening and growth for all the OECD and non OECD countries.

### 2.3.3 Growth and Institutions

There is a widespread belief among the economist that the quality of institutions in a country is very important to the development of growth and macroeconomic stability of the countries, i.e. investment, savings and growth. Countries with investors feeling secured about the property rights and the rule of law would be able to establish a better and stronger basis for economic prosperity.

According to North (1990, pp 147): Institutions can both formal and informal which stretches from taboos and unwritten traditions in one end to the laws and constitutions governing the countries. In North's own words (1990, pp110) - "Third World countries are poor because the institutional constraints define a set of payoffs to political economic activities that do not encourage productive activity".

North and Thomas (1973, pp91-93) argue that the secured and stable property rights are the main reasons behind the rapid rise of Western civilization and modern economic growth. The rationale was that businessman would not be motivated enough to accumulate wealth and become productive unless they are in control of their earnings.

Collier (1998) terms institutions factors, such as enforceability of law and rule of law, as government institutions that influences people ability to cooperate to reach towards mutual objective.

According to Dixit (2009), economic governance can be perceived as structure and functioning of the legal and social institutions that support economic activity and economic transactions by protecting property rights, enforcing contracts and taking collective actions to provide physical and organizational infrastructure.

Property rights are deemed essential as without the security or guaranteed of the wealth accumulated, there is no incentive for a party to invest its resources or capital in the first place. Enforcing the contract is important as multiparty may enter into contracts and during the term of contracts, one or more parties would felt that the terms have been violated. There need to be recourse for proper punishment so that fairness and justice could be restored.

Collective action refers to the common provision conceived by a society or community for the well-being of the general public, e.g. social safety nets, and for controlling the wrong doers, i.e. prosecutions and punishments on the transgressors.



The following are three important hypotheses explaining from the historical perspective on the developments that led to the establishments of institutions in a country and the impact on growth.

#### 2.3.3.1 Law and Finance Hypothesis

La Porta et al (1997, 1998, and 2000) suggest that legal origin is an important determinant of traits of the legal framework such as rule of law and property rights. Their hypothesis is important as they re-examine historically from legal perspective the role of legal origin on economic and financial framework across the countries. Their studies primarily attempt to rationalise why certain countries are able to institute effective legal, financial as well as political institutions that becomes the basis for strong economic growth, while other countries seems to bog down and becomes rather ineffective.

Their studies focus on enforceability of property rights that become the countries benchmark in enforcing the country's rule of law. Countries that have well written and enforcement of the property rights are deemed to have clear framework and modus operandi to perform transactions and protecting the rights of investors and creditors. The origins of the law, according to La Porta et al., can be traced back to colonial times when most nations were ruled by major superpowers, i.e. British, France, Germany and Scandinavian. Based on extensive research, La Porta et al. conclude that countries that were ruled by the British (common law) have laws that were more accommodating and able to provide greater latitude for interpretation by judges. It is deemed that the countries that were being colonised by the British are able to absorb, implement and localised the law according to their own unique circumstances.

They are less rigid on the requirements of presenting formal evidence. The judges tend to make judgment based on facts and evidence rather than based solely on the principles of codified law. They argue that laws were shaped more from the judge's decision and interpretation based on the judges' perception of the new developments. According to La Porta et al (2003), the common law is most likely to use the

judicial decision as a reference point to solve new cases. As opposed to Napoleonic doctrine, the law requires the reliance on judicial formalism. As a result, the inflexibility of the legal system in French colonised countries eventually affected the future development of the country's financial system.

In comparison, the French Civil law, which could be traced to the Napoleonic doctrine tend to be strict in interpretation and rigidly retained its historical roots of jurisprudence. The Napoleonic doctrine based on the notion that everything has been written and it left little room for the judges' interpretation. The judges were only considered the purveyor of law, whose purpose to execute law that has been explicitly stated in the doctrine. Moreover, the French law inhibit open discussion among the judges regarding laws, statutes, and past court decision that are in conflict between each other, that which impede the development of efficient legal system around the world.

As a result of the rigidity, most of the countries that are under French ruling have difficulty in applying the French legal law into solving the local problems. According to La Porta et al (2003), the common law countries are more open towards protecting private property rights that are foundations for development of sound financial system. In contrast, the French civil law are more supportive on the rights of the state rather than rights of protecting the private properties. Hence, the law and finance theory concludes that the British Common law supports financial development to a greater degree than the French Civil law systems.

Several legal scholars conclude that the German law are closer to the Common law than the Napoleonic doctrine. The scholars argued that countries with the common law have more comprehensive, discipline and progressive legal system than the countries that have adopted the French legal system.

### 2.3.3.2 Endowment Hypothesis

Acemoglu et al (2001) posits that the current legal and financial development of a country can be explained by the endowment hypothesis. The endowment hypothesis argues that the level of country's legal and social development is dependent on how historically the European colonisers treat the territories that they occupied. Primarily, the hypothesis postulates the role of mortality rate linking to the fatal disease in determining the colonisers' length of stay.

The authors documented in detail which territories colonisers found to be hospitable and which are not. Those countries that the European colonisers deem hospitable and decided to stay permanently, they would establish adequate legal and regulatory structures, so that those countries are able to govern effectively and manage their own affairs. Those occupied countries that deemed inhospitable by the colonisers would be considered as purely strategic centre to extract natural resources. The European colonisers would institute limited financial and legal institutions that the local government unable to effectively govern the country. Eventually, the economic growth of these countries faltered with growing unresolved social and political problems.

After gaining the country's independence, the local government would inherit the previous colonial master's mentality of stripping away the country's natural resources in order to remain in power for a longer period. In this circumstance, rule of law was only used to serve their vested interest rather than to govern their society. Examples of these countries are mostly the third world countries, which are characterised by lack of formal institutions such high corruption, ineffective bureaucracy, limited transparency, lack of accountability, economic instability and lawlessness.

The second factor in determining European colonising strategy is the indigenous population density. According to Acemoglu et al (2004), when the population density is high, the colonisers tend to capture

the native and put them into force work. But if the density of the population is lesser, the colonisers tend to settle permanently and less likely to treat the new territory as extractive institution.

### 2.3.3.3 Political Process Hypothesis

Acemoglu and Johnson (2005) stipulates in his growth hypothesis built from his endowment hypothesis that differences in the political institution caused differences in economic development. Their hypothesis hinges on premise that the evolvement of the political process, either based on de jure or de facto reasoning, is essential in determining the type of political system that emerged, which thereafter determines the type of economic development

De jure refers to the power of political institutions that existed during that period. In absolute monarchy, the political institutions provide unlimited constraint of power to the monarchy and the monarchy has unconditional power to rule the country. There can be gradual change in the distributions of property rights to his subjects. Power is more concentrated in the monarchy and there is less constraint and check and balance by other governing bodies. In contrast to the constitutional monarchy, the political power provides limited power to the monarchy and greater power to the parliament.

The other source of political power is the de facto political power. This power originates from grassroots levels where certain groups of people are able to gain enough support to demand drastic changes from the ruling political party, either amicably or forcefully. Typically, if they succeed to realise their objectives, they would then restrict the de facto power and request for more distributive power for the grassroots. A restricted political power with its own check and balance would be able to produce better institutional environment, e.g. better enforcements of property rights and private contract, which is vital for transformation into better economic performance of the country. Economic institutions are also

important as they assist in allocating the resources to the best usage. Without property rights, they will be no incentive to invest in physical or human capital or adopting the latest technology.

Acemoglu and Johnson (2005) define property rights as rules and regulations protecting citizens against the power of government and bureaucracy. Property rights encompass not only the extent of non-interference by the ruling parties in expropriating the property of the private citizens but also include the extent of not showing any favouritism against one party or another in awarding private contracts. A private contract is defined as fulfilling ones obligation to another as stipulated in the agreement. The inability to enforce the appropriate penalty if one party broke the contract, signifies the weakness of the country's economic system. However, according to Acemoglu et al (2004), the failure to fulfil the contract obligation can be remedied easily by modifying the terms of the contract by requiring more risk premiums or converting the equities into debt instrument. However, lesser enforcement in property rights would pose more problems to rectify as it normally involves requesting the ruling party to change its practice, which is difficult to accomplish.

Examples of the political system that arrived via de facto process, is the American Revolution which fights for their independence from the British colonisation. Once the dissidents overthrew their British occupiers, they managed to put together a political framework based on the executive power of the President, with senate and congress as the other legislative bodies that serves to check and balance the power wield by the U.S. President. One of the organisations evolved from this political process, which is free to exercise its independence without outside interferences from other government bodies, is the Federal Reserve Bank of United States.

According to Acemoglu and Johnson (2005), de facto power has tremendous power to influence the political institution during that period, since the de facto power largely controlled the distribution of

resources and wealth. Their success in overtaking the political system has enormously influenced how the economic institutions evolved and the country's economic growth. He posits since this group of power previously control the distribution of resource, their success in overthrowing the government has great bearing in making the economic institution more align to the market needs rather than the vested interest of political institutions.

#### 2.3.3.4 Empirical evidence on Institutions and Growth

According to Rodrik (2003), the types of institutions that are currently adopted by different countries were influenced by its historical origins, which are linked to the country's geography, political and other initial conditions factors. He pointed that those successful nations, especially the developed and the newly emerging economies, are able to blend between the unorthodox elements with orthodox policies to achieve success in protecting property rights and enforcing law. He also finds not only institutional structures can vary between countries but they also can vary within a country across time as illustrated by Korean model of subsidising major conglomerate. During the early stages of economic development, the policy works well to boost the country's economy growth, however, during the 1990's the policy backfired and one of the reasons contributing to the country's financial crisis.

Rodrik (2008) finds that emerging economies in Latin America, except Chile, that has instituted economic reform as advised by the Washington Consensus has witnessed their economic growth faltered, unlike East Asia emerging economies, e.g. China, India and South Korea, that have adopted unorthodox ways of reforming their economy. These East Asian countries found to perform better to ensure property rights and maintain macroeconomic stability than those countries opting to follow strictly by Washington Consensus economic prescription.

According to Li (2003) and Dixit (2004), such institutions that can protect property rights and ensure rule of law can be both informal , e.g. moral codes and self-enforcing agreements, or formal which involved enforced legal rules by a third party. Institutions that are able to induce socially desirable outcome from the actions by the economic agents are considered exceptional.

According to Dixit (2009), in most countries there exist formal institutions, in which the government would administer the rule of law and protect the private property rights. The failure of the government to provide the necessary formal institutions could impede the progress of its economy. Less developed economies are characterized by weak formal governance as they have not developed and accrue sufficient knowledge and experience in managing large number of transactions and properties. Similarly, there are certain developed countries that are in similar circumstances that have not developed adequate formal institutions.

According to Cleassen and Laeven (2003), both formal and informal form of institutions is important in governing the transactions between private parties and government sectors in the economy. It allows the enforcement of property rights among different parties and sectors that provides incentives for investment and risk taking as well as encourages market-based commercial and financial transactions.

The above discussion leads to the next question: i.e. “Can informal or private governance able to assume the role of protecting property rights and enforcing the contracts in lieu of formal governance?” Dixit (2009) adds that in developed economies, there exist informal social and market institutions that are already functional that are able to assume the role of dysfunction formal institutions. He postulates that for the private institutions to assume the role of formal institutions, three methods have to be in place, i.e. first-party, second-party and third-party systems.

The first party system operates essentially based on the internalizing value system or, as he terms it, “pro-social preference”. It is behaviour associated with one's feelings, e.g. feeling satisfied for behaving honourably or feeling ashamed and guilty for committing wrongdoings. It is important that these sense of right and wrong ingrained in the individuals, so that it can be transmuted and collectively reflected on how the society functions. The first party enforcement between firms can be achieved by combining the contractual firms into one entity to achieve one common objective as stipulated by Williamson transaction cost theory (1985). The advantage of merging is that instead of governing different units disparately, now it becomes one closed unit. It evolves into relationship between principal and agents rather than relationship between two disparate parties.

On the other hand, in order for several distinct firms to be privately governed effectively, it requires second party enforcement based on multiparty interactions. In order to ensure the enforcement work, it requires “stable community with many interactions, and good information flow about members’ behaviour” (Dixit, 2009). However, as the group size expands, the second party enforcement weakens as information gathering and channel of communications deteriorates (Li, 2003). According to Li (2003), in order for large scale group to become effective, the method of informal governance has to be transformed into formal method of governances. Li draws the distinction that in large scale formal institutions, it requires high initial fixed cost for the legal system to pass laws and establish police force to enforce court’s decision. In contrast, informal institutions of governance requires less fixed cost initially, however, as the group size grew larger, the marginal cost becomes greater and finally becomes less economical to operate beyond certain group size.

The final level is the third party system managed by outside parties, who are privy to the ongoing transactions among multi parties (Dixit, 2009). The third party institutions can be in different forms, i.e. (1) private adjudicators (2) party to provide the necessary information for the inputs for



enforcements (3) party responsible for enforcements for profit. However, the disadvantages of informal (private institutions) are the extent of effectiveness of private communication network and threat of expulsion from the group. As the group size becomes bigger, their effectiveness worsens or becomes too costly to maintain the level of effectiveness. Notably, if the enforcement is performed by profit motivated party, the party can use its power to extract as much profit from those under its protection.

According to Dixit (2009), how well a country's economy progresses is dependent on the extent of interactions between the formal governmental institutions— i.e. the constitutions, legislature, courts and the police – against the informal private and social institution – i.e. the norms, behaviour and private actions for enforcements against violations.

Changes to the current formal institutions could cause temporary disequilibrium before new changes takes into effect. Reformation can be tedious as the process involves overcoming resistance to the political process, revamping the information flow and creating common knowledge to achieve to the new state of equilibrium. Dixit (2004) shows that changes to the formal institutions can even weaken the performance of the existing informal institutions. Government initiating top-down changes to reform the existing institution can turn awry without real understanding how the middle and low levels administrators reacted to changes. Without the right incentives, adequate communications and proper knowledge conveyed to them, they will be less receptive and motivated towards the new changes.

Before changes were to be made on the existing formal institutions, it is advisable for the policymakers to understand the current structure, properties and the underlying reasons for the establishment of these current institutions. Any changes enacted without understanding fully the nature of the existing

institutions can have detrimental effect on the economic performance of the community and country. The establishment of institutions that show success in other countries does not mean that it can be implemented successfully in one country. The newly implementations for universally recognised institutions should be done in such a way that it is customised according to the local customs, rules, temperament and environment without causing undue disruptions to the other current in-place formal or informal institutions. Countries that are able to develop their own formal legal rulings and adopting from other countries legal rulings, but able to localise them, are able to establish a better comprehensive legal institutions than those countries that only copied legal coding outright from others (Berkowitz et al, 2003).

Numerous literatures have been written examining the significant effect of formal institutions on economic growth and financial development and to a certain extent on the investor's confidence. The followings are some of the empirical evidence on the effects of institutions factors, specifically democracy, protection of property rights, legal or rule of law and corruption

#### 2.3.3.4.1 Level of Democracy

Kormendi and Meguire (1985) and Scully (1988) are the first papers using institutional indicators to test against growth and investment. They test a sample of 47 countries between 1950 and 1977 using macroeconomic variables with civil liberties as the institutional indicators from index constructed by Raymond Gastil for Freedom works. Their results indicate that civil liberties have significant impact on investments in the country. Meanwhile, Scully (1988) also uses Gastil index by using independence of judiciary as a proxy for the rule of law on a sample of 115 countries against income growth. His result indicates that countries that have greater civil liberties have income growth nearly double than those that have restricted freedom.

Barro (1996) and Helliwell (1994) find that there was significant effect on income growth using Gastil Institutional index only if education and investment variables were present in the regression. Both concluded that democracy has indirect impact on growth via those two exogenous variables.

Rodrik (1999) examines the impact of shocks on growth on several countries with varying types of institutional make up. He finds that countries with poor institution of conflict management by proxying it with Gastil's civil liberties variables, recorded greater decline in growth than countries with better institutions of conflict management. He also examines other factors such as deep latent social conflict within the countries, proxied by income and land inequality variables, and the impact of growth after economic shocks. His result also indicates that those countries with deep latent social conflict tend to experience deeper growth decline due to external economic shocks. In another words, countries with lesser political freedom experienced greater declines in income growth

In a developing economy, an improving democracy may have significant effect on political and economic conditions (Rodrik and Wacziarg, 2006; Borner et al, 1995). Siegle et al. (2004) argued that democracy brings political check and balances, responsiveness to citizen priorities, openness, and self-correcting mechanisms, which in the long term contribute towards growth.

Butkiewicz and Yanikkaya (2006) find that the level of significance of democracy on growth is highly depended on the sample of countries chosen and estimation technique. The author finds that the rule of law has shown a more consistent positive effect on growth compared to the affect of democracy.

Sandholtz and Koeltz (2004) and Hellman (1998) find that post communist states, which embraced democracy, were the most successfully reformed and this resulted in higher economic growth. They also have lower rate of corruption. Their explanation is that governments, which did not face democratic elections, would face more obstacles instituting economic reforms and combating corruption. Corruption

thrives in an undemocratic environment, where secrecy is the norm and only the privilege group have significant access into the state economic assets. With the introduction of democratic electorate, the privileged few would have lesser room to hide their corrupt activities and corrupt officials would more likely be thrown out from their office as the government institute transparency as part of economic reform.

Drury et al (2006) postulate that democracy encourages political stability that helped to spur economic growth, and at the same time, mitigate corruption. The assumptions were those who voted for democratic elected officials would more likely to vote out those officials who are considered corrupted. In contrast, in an undemocratic nation, the affect of corruption would have a significant negative effect on growth as the process of removing the corrupt official can be cumbersome.

In contrast, a study by Helliwell (1994) finds that democracy spurs education and gross domestic investment, however, has a negative and insignificant effect on growth.

#### 2.3.3.4.2 Property Rights

The work of Acemoglu and Johnson (2005) provides additional empirical evidence on the mechanisms through which initial institutions and legal origin may influence finance. More specifically, they test for the relative importance of ‘contracting’ and ‘property rights’ institutions. The contract, which is proxied by legal formalism, enables private contracts to be established among individuals. Private rights, which protect the property rights of citizens against rulers, act as proxy for citizens’ protection against government expropriation as well as the limitations of the government influence. They treated both contract and property rights as endogenous variables and use legal origin and settler mortality as instruments for legal formalism and for property rights. They find that there is strong correlation between legal origin and legal formalism, and also between settler mortality and property rights institutions.

Property rights institutions are found to have a larger and significant impact on long-run economic growth, investment and financial development. They posit that individuals can reduce the disadvantages inherent in institutional contracts by restructuring these contracts appropriately and diligently assuming they are enforceable. However, the failure of property rights, as an institutional factor, can have grave consequence as it could reduce the integrity of contracts between individuals and the government and would discourage private sectors to invest.

Clague et al (1996) use contract-intensive money (CIM), which is M2 over GDP minus currency, as indicator for a country's level of protection on property rights. The rationale using that indicator as proxy is that investors won't hold their asset in the form of bank deposit or near-money instruments if they are not confident that they will be able to exchange the deposits and financial instrument back into hard currency. Their results show that countries that have high level of CIM or protection of property rights were always associated with higher level of per capita income, total factor productivity and higher rates of investment.

In terms of legal origin, Beck et al (2003) conclude that countries that inherited French civil law tend to have lesser levels of private property rights protection. Again, this is consistent with the view that French legal origin countries place comparatively less emphasis on the rights of private property holders than countries with a Common or German civil law tradition.

#### 2.3.3.4.3 Rule of Law

Several studies have traced the impact on the rule of law on the growth. Demirguc-Kunt and Vojislav (1998) show that countries with legal institutions that protect outside investors tend to create better functioning financial systems that fund faster growing firms.

Dollar and Kraay (2000)'s empirical result indicates that rule of law and property right have significant impact on the growth of poor nations, but not affecting income distribution.

Claessan and Laeven (2003) indicate that countries with strong legal rules would have strong investors' protections, which would enable smaller firms to secure source of funding, even though with insufficient collateral. In contrast, countries with less property protection, smaller investors would have difficult time securing funding with marginal collateral. In this vein, Himmelberg et al. (2000) develop a theoretical model in which he concludes that effective investors' protection would reduce the cost of capital, improves capital allocation, and thus increases investment and growth.

Beck and Levine (2002) examine the impact of legal institution influencing distribution of capital across the firms and industries. They find that legal institutions have positive impact on financial institution by facilitating distribution of funds to various firms and different industries. By instituting a sound legal system over the current financial system, it would induce the financial system to be able to effectively distribute capital to the most deserving industries and companies.

Levine et al (2000) examine the level of legal and regulation development has in influencing the deepening of financial sectors. They find a positive connection from cross-country studies between legal and regulatory environment with the level of financial development. Countries that ensure the integrity of debtor rights to claim, legal system that robustly enforced contracts, accounting standards that are transparent and comprehensive, tend to have better developed financial institutions.

Beck et al (2003) investigate the mechanism in which legal origin affect financial development. They conclude that countries with the legal system, which is the closest to bridging the gap between the countries financial needs and current legal system requirement, are able develop a better and more effective financial system:-

Chinn and Ito (2007) find that a country with relatively well developed financial system, the impact on savings will only be marginal even if the country decides to deepen its financial system via instituting better legal system, reduction in corruption and liberalised financial market. On the other hand, in less developed countries, the effect on savings would be more significant and greater with better legal system, less corruption and more liberal financial market. Chinn and Ito (2007) agree with Bernanke that in order to balance out the disproportionate level of saving surplus in emerging economies is by adopting improved legal system and become more transparent with their financial market. In essence, these measures would eventually reduce the high level of savings that exist in these emerging economies.

#### 2.3.3.4.4 Corruption

Sandholz and Koeltz (2004) findings confirm that corruption tends to increase in a country with weak democratic institution and lower income per capital. Mauro (1995) finds empirically that corruption imposes substantial economic cost by causing political instability and inefficient bureaucracy, which discourages private investment that adversely affects on growth. Ali (2003) similarly argues that countries with high level of economic growth are characterised with positive institutional factors such as high levels of judicial efficiency, low levels of corruption, effective bureaucracy and protected private property.

Swaleheen (2007) argues that corruption has negative effect against gross national savings, but not against gross domestic savings. The reason is that gross national savings includes savings deposited outside the country, which is synonymous to where corrupted money have been invested. However, Bardhan (1997) argues that in a country with complicated rules and regulations, corruption may actually improve efficiency and increase the countries' economic growth. Braun and Di Tella (2000) provide evidence that corruption in a country is positively correlated with the rate of inflation. Inflation variability makes prices less informative, and can increase the cost of auditing by government

procurement agents. It makes difficult to detect whether price increase due simply by inflationary effect or ongoing corruption practice in acquiring capital goods.

## **2.4 SUMMARY: RATIONALISING THE IMPORTANCE OF PREVIOUS STUDIES FOR CURRENT RESEARCH.**

The main aim of the thesis is to identify the impact of institutional factors on savings for selected emerging economies. As mentioned in the introduction, there has not been any study examining how various institutional factors affect the level of savings directly, although institutions can have an indirect impact via economic growth.

Previous theories on savings, i.e. Permanent Income Hypothesis (PIH), Life Cycle Hypothesis (LCH) and Consumer Optimization Model, as well as the empirical evidence, were mostly focused on finding the relationship using selective demographic factors (e.g. young and old dependency, population growth), macroeconomic factors (e.g. real interest rates, inflation, GDP growth), and financial factors (e.g. government savings, term of trade and financial development) against savings.

Hence, the initial point of analysis is to use the LCH model, similar to the previous empirical testing to find the relationship between demographic, macroeconomic, and financial variables with private savings in the 20 emerging economies. The rationale is to use it as the basic study in order to find any similarities or differences compared to the previous empirical evidence. The study also examines the regional effect by grouping the countries by region and examining the differences and similarities between regions. The empirical results and the comparisons are highlighted in Chapter 4.

We then extend the study by including the institutional factors, specifically the formal or non-market institutions, and to examine their impact on private savings, together with controlling variables, i.e. economic, financial and demographic factors. In order to incorporate newly institutional variables



into our analysis, we gathered previous theories and empirical evidence related to institutions. The hypothesis by La Porta (1997, 2003), i.e. legal origin, and Acemoglu et al (2001, 2004), endowment and political process become our framework for analysis to understand the importance of institutions on the country's economic performance.

Regarding the literature review on institutions, we first explore Dixit's (2009) model on the dynamics of informal institutions and the caveats to reforming formal institutions. We also review the effects of various institutional properties, i.e. democracy, protection of rights, rule of law and corruptions level, on the country's income growth and financial development. We then perform in Chapter 6 empirical testing between several institutional factors against private savings, in which we then compare the results against previous empirical evidence. The final empirical results will test our developed hypothesis on the effect of institutional factors towards private savings. The hypothesis that we have developed is to demonstrate the relationship between institutions and savings in light of previous empirical evidence between institutions and growth.

In essence, Chapter 4's empirical examination of the effects of the traditional determinants, i.e. demographic, macroeconomics and financial factors, on savings is further extended in Chapter 6 to include the institutional factors. Hence, the main contribution of this study is to examine the effects of different types of institutional factors on savings as well as the institutional effect interacting with financial development towards savings.

Aside from the above impact on savings, we also look at the relationship between growth and financial development. On the theoretical standpoint, we refer to two models, i.e. the financial development model by Diamond (1983); Diamond and Dybvig (1984); and Becievenga and Smith (1991) and the financial liberalization model by McKinnon and Shaw (1973).

The rationale for examining both models and previous empirical evidence on financial development is to find the relationship between growth and financial development as both variables have a significant impact towards savings based on previously empirical evidence on savings. Although both financial development and financial liberalization models hypothesize that financial development precedes growth, however, a few of the empirical studies pointed out differently due to difference in the period of study, methodology, and geographic locations. In order to understand the causality effect for long and short term between growth and financial development for the selected 20 emerging economies for the 30 years of study, we perform time-series econometric testing. The results using time series VAR and VEC methods shed some light on whether financial development have causality effects on growth and therefore concur with the financial development theory as well as other previous empirical results.

## **2.5 HYPOTHESES ON SAVINGS -INSTITUTIONS AND FINANCIAL DEVELOPMENT- GROWTH NEXUS**

The literature synthesised above has dealt mainly with the effect of institutions on either investments or growth and very few studies have discussed the effect on savings. Hence, in this section, we explore the relationship further between the effects of formal or non-market institutions on savings, especially in emerging economies.

If the macro economy of a country is grounded on sound fiscal and monetary policies, citizens are provided with civil liberties and political representation, private incentives are aligned with social objectives, property rights are protected, the rule of law is enforced and unforeseen shock are mitigated by social insurance; then a country is considered to have high quality institutions. On the other hand, if these types of institutions were not prevalent or there are a few of them only, then the economic activities

of that country could be relegated to small interpersonal exchanges. Firms or agents in a weak institutional environment would not be able to engage in complex, long-term and multiple contract exchanges supported with sound enforcement of rules, norms or laws. Transaction costs are relatively high as private firms have to operate in small scale dealings. Bribery and corruption would flourish as firms have to engage in these illicit activities to facilitate transactions. Factor substitution costs are high as the economy is engaged in low specialization and using simple technology, hence the production operation becomes less efficient and effective. There is often breakdown in rule of law as it is deemed unenforceable and few would respect the law. Financial institutions would hardly exist as there are no regulations or law which enable them to effectively perform their main function to receive deposit and loan funds.

In this environment, the public would be sceptical about depositing their money as they are less assured on the credibility of the savings institutions to keep their money safe and to provide decent return. Most of the money would be either be saved under the safety of their home or invested in the black market to money lenders based on simple trust. In turn, the financial institutions are not confident in providing loans as they lack the legal, enforceable means to recover back the loans from the borrowers in the event they default on their payments. In crux, without proper established institutions, there won't be any formal channel for the public to deposit and borrow money, implying lesser savings and investments in the economy.

Thus, we hypothesise that having a sound non-market institutional environment support with respect to the rule of law and property rights and well developed financial institutions are vital for improving private savings in the economy.

Secondly, we also hypothesise that in the short and long term, improvements in the financial system or deepening the financial intermediation process drives the country's economic growth by mobilising the economy's savings for productive investment. In the real world, it is vital for that those who have surplus funds are able to provide these funds for those in need. Therefore, households and private sector, which require funding, are able to obtain from those with surpluses. It is the role of financial intermediaries, according to Diamond and Dybvig (1983), Diamond (1984), Greenwood and Jovanovic (1990) and Becievenga and Smith (1991), that are best suited to fulfil the role of allocating the financial resources from those who have surpluses to those in deficits. Financial intermediaries are able to minimize the transaction cost as they are able to operate in larger scale and have technical know-how to perform their role. Without conducive financial institutions and environment, there won't be a great deal of investors willing to allocate their funds into the country's real sector such as in manufacturing, service and agriculture, hence the economic growth would be adversely affected.

In summary, we hypothesise that improved and conducive financial institutions, and environment is vital to spur economic growth in the short and long run.

## **2.6 CONCLUSIONS**

Three types of theoretical models have been discussed in this chapter. These deal with understanding the effect on savings, based on LCH, PIH and Consumer Optimization Model, with additional theory examining growth-savings nexus by Solow-Swan. However, LCH and PIH have received their own dosage of critics. Berheim and Scholz (1993) criticised both LCH and PIH for making assumptions that the populations were smart enough and well aware of the macroeconomic variables, e.g. earnings, prices, household consumptions and macroeconomic trends, to make wise and rational decision on the proper

level of savings and consumption. According to Bernhaeim, (1994) Americans lack the financial sophistication in making informative decision regarding the optimal level for savings and consumption.

Then we looked into the importance of financial development in propelling the countries growth. Models on growth accounting by Diamond and Dybvig (1983), Diamond (1984), Greenwood and Jovanovic (1990) and Becievena and Smith (1991), has gained ground in explaining the importance of financial intermediaries and the process of financial intermediation in improving and distributing income in the countries. McKinnon-Shaw model emphasise the disadvantages of a repressed financial system and urgency of liberalizing the financial institutions for the countries to enjoy long-term growth. McKinnon and Shaw hypotheses have shifted the world paradigm about importance of financial liberalisation in allocating financial resources to the deserved lenders, who are able to maximize the returns on their credits received. As a result, movement to liberalise the financial system gained ground in the international financial community, especially in the developing and third-world countries, which resulted in the creation of the Washington Consensus. Incentive are to provide in the form of international bank loans for the countries who agreed to implement the resolutions, which primarily deals with liberalizing and opening their financial and trading sectors.

Finally, we discussed the role played by non-market institutions based on respect and enforcement of property rights. This proposition first originated in a book by North (1990) and has been followed up by numerous authors like La Porta et al (1997,1998,2000), Acemoglu et al (2001,2004,2005) and Rodrik (2000,2005,2008) discussing about the origins and importance of institutions in ensuring long-term economic growth. This new approach has resulted in new additions to the original Washington Consensus, which includes of salient points such as proper financial codes and standards; independent central banks; corporate governance and anti- corruption. The new revamped resolution was coined as “Augmented Washington Consensus” by Rodrik ( 2005).

In our study, we examine the role and importance of non-market institutional factors in affecting aggregate savings vis-a-vis financial development and growth. We postulate that non-market institutional factors play a significant impact on affecting savings in this respect.

## **CHAPTER 3**

### **TRENDS AND DESCRIPTIVE ANALYSIS – PRIVATE SAVINGS AND DETERMINANTS**

#### **3.1 INTRODUCTION**

Several stylised facts have been noted from previous studies by Schmidt-Hebbel and Serven (1999). They noted that the world savings rate have been declining since 1970s and savings rates have shown divergent patterns across regions.

In order to examine closely the savings behaviour and its determinants, we first examine twenty emerging economies chosen from three regions, mainly Latin America, MENA and Asia Pacific. The countries selected are:

- 1) Latin America: Argentina, Brazil, Chile, Mexico, Venezuela and Columbia
- 2) MENA and other countries close to the region: Saudi Arabia, Egypt, Morocco, Tunisia, Turkey, Israel and South Africa
- 3) Asia Pacific including India : India, Indonesia, Philippines, Thailand, Malaysia, Singapore and South Korea

The selections of these countries are based on data availability, proximity and their economic performance.

While the discussion is centered on the three regions identified above, the analysis in this chapter can be distinguished into three parts.

The first part provides each country's background by briefly discussing the major macroeconomic trends, including economic growth and inflation, as well as the country's political milestones since 1970s. The discussion is organized into the three regions, and covered in Sections 3.2 until 3.4 accordingly.

The second part analyses savings and its determinants by region as illustrated in Section 3.5. It discusses trends and trajectories of savings and several other determinants of savings - i.e. GDP growth, financial development, inflation, real interest rate, young dependency, old dependency and urban growth – for each region. A 5-year average to trace distinct changes in trends and amongst countries in the same region is examined for the period between 1970s until 2004. It includes analysis and comparison between the countries as well as examining their progress and declines thorough out the periods. The rationale presenting in this form is to provide descriptive overview of the saving determinants before these determinants are empirically tested.

The third part of the analysis is collecting the average statistics of each determinant and grouping them according to regions, as shown in Section 3.6. Here, we get a better overview of the performance of savings and its determinants for each of the regions.

Most of the savings determinants that are being used in analyzing each country are derived from variables used in the LCH, PIH, consumer optimization models and the past researchers as illustrated in the literature reviews (refer to Section 2.2.3). This data, which formed the descriptive analysis, was derived from World Development Indicators, International Monetary Funds, Penn World Indicators and scholar journals. The specific description of the data can be found at Section 4.3.

## **3.2 LATIN AMERICAN REGION**

### **3.2.1 Argentina**



Argentina inconsistent GDP per capita ratio from 1970 to 1990 indicates that the country was either in the state of economic or political turmoil, or both. Inflation during that period fluctuated erratically from 14 percent to as high as 3,000 percent (Exhibit 1.3). A high growth in one year would then followed by negative growth the following years. In the 1970s, most countries in the world including Argentina was adversely affected by the OPEC oil embargo, which caused world oil prices to rise rapidly overnight. Argentina Central Bank reserves were used to finance importing oil, resulted the country to incur huge debt. From 1973 to 1977, the government received credit loan from IMF amounted to USD1.7 billion from International Monetary Fund (IMF) (Exhibit 1.5). In 1976 the economic situation deteriorated to the extent that GDP per capita fell to minus 3 percent (Exhibit 1.1) and Argentina was experiencing hyperinflation at 444 percent (Exhibit 1.3). During that period, Argentina was governed by a new military regime, which advocated open economy, stronger peso, importing more foreign goods and borrowed extensively (Smith, 1991, pp 16-20). Total debt over Gross National Income (GNI) ratio rose from average 3 percent before 1976 to 6 percent in 1978 and the level of debt servicing remained high until 1989 (Exhibit 1.4). By 1977, GDP per capita growth increased to five percent before it declined to minus five percent the following year (Exhibit 1.1). In 1978, the government introduced new open market policy, which included regular devaluation, reduction in gross domestic investment (GDI) and privatising several state government agencies, however, the policy backfired, resulting the economy to deteriorate.

In 1981 and 1982, the GDP per capita growth hit minus 7 and minus 6 percent, respectively as the economy felt the brunt of the world recession with debt over GNI was as high as 6 to 7 percent of GDP (Exhibit 1.4). In 1982, Argentina issued “circular 1050” where it tied adjustable loan rates to the value of the U.S. dollar, in which caused monthly interest payment to rise 10 times between early 1981 to July 1982. Loan guarantees were being extended by the government to the manufacturers to

cushion them from the sharp drop in peso to pay off debt in US dollar. This measure together with military involvement in the Falkland war contributed steep rise in foreign debt. In 1983, the government decided to freeze the wages, cut defence spending and decided to introduce several privatisation measures (Martirena-Mantel, 1989). However, the privatisation measures was hardly well received by the investors as they deemed too risky to be involved in, albeit the GDP per capita growth was rather mild at 2 percent in 1983 (Exhibit 1.1). In 1985, GDP per capita growth fell to minus 9 percent due to severe cutback in provision of credit to private sectors, which fell from 34 percent in 1981 to 17 percent in 1985 (Exhibit 1.2).

In 1989, Argentina was heavily indebted with accumulated external debt of US\$ 65 billion, and output production was falling. Inflation peaked at 3,000 percent (Exhibit 1.3). By July 1989, a new government came to power headed by President Carlos Menem. In 1991, Domingo Cavallo, the Minister of Economy, instituted currency board to peg the local currency against US dollar, i.e. 10,000 australes per U.S. dollar in order to eradicate hyperinflation. As a result, this measure managed to reinstate the local currency back as the premier currency to conduct day-to-day trading. It also restored Peso as the Argentine currency, with a monetary value pegged by law to the ratio of one to one against U.S. dollar (Patrice, 2007, pp 33-40).

From 1991 until 1994, Argentina's previously trade surplus turned to deficit. However, overall fixed investment has increased, resulted in increased in exports and strengthening of peso. As a result not only the fixed exchange rate made imports becoming cheaper, but also Argentine's foreign debt increased due to increase borrowing to service the loan payment. From 1990 to 1991, Argentina registered growth rate of 11 percent and 10 percent (Exhibit 1.1), however, declined precipitously to 4.5 percent in the following year.

By 1995, Argentina experienced minus 4 percent growth (Exhibit 1.1) as large number of depositors withdrew their money from the banks due to financial uncertainties from the recent Mexico financial crisis. Even in 1999, the country's per capita growth rate remained at minus 4 percent due to aftermath from Asian financial crisis affected Argentina, which resulted export to decline substantially. The government later received USD 7.4 billion credit facility from IMF Structural Adjustment loans with various austerity conditions attached. The government had to pursue restrictive fiscal policy by imposing higher tax and reducing budget for public sector (Taylor, 2002). In 2001, the government under severe financial constraint defaulted on interest payment on the securitized debt amounted to USD93 billion (Taylor, 2002). By 2002, fixed pegging against US dollar was scrapped resulted the local currency to devalue by 40 percent overnight. Instead of trading at parity, it has declined to 3 Pesos to 1 USD (Exhibit 1.6). By then, GDP per capita registered minus 11 percent growth, which is the worst growth since 30 years ago (Exhibit 1.1).

The bank crisis of 2001 and 2002 has contributed to consolidation of the financial sector that has reduced the number of financial institutions from 127 in 1995 to 85 in October 2001. During the financial crisis, the Central Bank has injected capital into the state-owned and private domestic banks to remain afloat. This has left a bitter taste to the foreign bankers in such that a few of them discontinued their banks from operating in Argentina (Mussa, 2002).

In 2003 the Argentine economy began to record high growth of 8 percent as GDI share increased from mere 12 percent in 2002 to 19 percent in 2004 (Exhibit 1.7). This growth was attributed to the surplus in trade and the government investment in infrastructure projects. It was also boosted by the return of local and foreign investors investing again in the economy.

### 3.2.2 Brazil

In the 1970s, Brazil achieved robust industrial growth by adopting import-substitution policies in several sectors, i.e. steel, aluminium, fertilisers and petrol chemical, however, it had to import substantial raw and capital products (Carbaugh, 2009, pp256). Brazil GDP per capita growth (Exhibit 2.1) was relatively high before 1980s. It started at 6.1 percent in 1970 before growing and peaked at 11.3 percent in 1973 before succumbing to oil crisis and reached new lows at 3 percent in 1975 (Exhibit 2.1).

In the early 1980's the government decided to cut deficit, by reducing imports, while expanding exports but yet still pursuing its import-substitution policy. In 1982, the Mexican debt crisis, caused by the Mexican government inability to meet debt repayment, has spread across other Latin American countries. International bankers began to lose confidence in the ability of most Latin American countries to meet current debt obligation (Abreau, 2004). In 1981 and 1983, GDP per capita growth declined to minus 6 percent as the economy slid into recession (Exhibit 2.1). With increased in world interest rate, Brazil total debt over GNI rose from 3 percent in 1976 to 7 percent in 1982 (Exhibit 2.4) and Brazil received loan of USD550 million from IMF (Exhibit 2.5).

The 1980s became known as the “lost decade” as a result of growth stagnation, hyperinflation and the increase in the external debt. However, in 1986, GDP per capita rose to a modest 6 percent growth (Exhibit 2.1). Inflation (Exhibit 2.2) accelerated and became uncontrollable before the government introduced a new currency called “Cruzado” and implemented temporary wage and price indexation freeze programme. While initially the programme managed to stabilize the general price and boost consumption, however, eventually producers were not able to sustain the price freeze and the country's deficit kept on growing (Baer, 2001). By 1988 and 1990, GDP per capita dropped to new lows of minus

2 and minus 3 percent, respectively (Exhibit 2.1) and inflation reached to 3,000 percent in 1990 (Exhibit 2.6).

The newly elected President Collor de Mello was impeached in September 1992 after two years in the office for alleged corruption. In 1994, a new stabilisation plan was instituted named “The Plano Real” or Real Plan, which pegged the new currency, i.e. Real, against U.S. dollar in the hope of containing inflation (Baer, 2001, pp199-215). The new economic policy consisted of controlling the exchange rate, which should be kept within an interval called “banda cambial” that would be determined by the Brazilian Central Bank. These intervals would be periodically revised based on the current inflation rate (Baer, 2001, pp199-215). In 1997, inflation was reduced substantially, but not deep enough to avoid rapid Real appreciation during the transition phase of the Real Plan. Previously, in 1996, Brazil decided to privatise its service sector, i.e. in telecommunications, banking, energy, commerce, and information technology. It resulted increased in Foreign Direct Investment (FDI) from USD1.2 billion in 1996 to USD28 billion in 2000 (Exhibit 2.3).

In 1998, after agreeing to fiscal adjustment programme and structural reform, Brazil received IMF-led international loan amounted to \$41.5 billion. A year later in 1999, Brazil ceased pegging Real against US Dollar and allowed it to devalue (Exhibit 2.6). The devaluation helped to ease the economy decline as the per capita growth only declined to minus 2 percent that year. The government began to institute new economic programmes based on three major monetary policies: i.e. inflation target regime, a floating exchange rate policy and adoption of fiscal responsibility law. The adoption of these policies helped to re-stabilised the economy as the economy registered one percent growth in 2000 (Baer, 2001, pp199-215).

### 3.2.3 Mexico

In the middle of 1970's, Mexico became a major exporter of oil. With the increase of oil price, the government decided to embark on expanding the economy by investing on social development projects and instituting import substitution policies, which entailed heavy capital expenditure. Mexico GDP per capita growth peaked in 1973 at 4 percent before declined to one percent in 1977 (Exhibit 3.1) before rising to 6 percent in 1978. The growth can be attributed to government expansive fiscal policies by investing in infrastructure and market substitution industries, which was financed by foreign credit (Lustig, 1998, pp28-59).

In 1982, Mexico was facing financial crisis with increased inflation, falling oil price, higher interest rates and overvalued peso (Lustig, 1998, pp14-20). By 1983, inflation peaked at 102 percent from 28 percent in 1981 as result of the government sudden measure to devalue the currency in order to reduce imports (Exhibit 3.2)

In April 1989, President Carlos Salinas de Gortari announced his government's national development plan for duration of 1989-94, which called for annual GDP growth of 6 percent and an inflation rate similar to those of Mexico's main trading partners. Salinas planned to achieve this sustainable growth by boosting the investment share of GDP and by encouraging private investment through denationalization of state enterprises and deregulation of the economy. His first priority was to reduce Mexico's external debt. In the middle 1989, the government has reached agreement with its commercial bank creditors to reduce its medium- and long-term debt (Lustig, 1998, pp28-59)

In the early 1990's, the Mexican economy began to grow again as result from the government pursuing a restrictive fiscal policy, a fixed exchange rate, and anti-inflationary policy. GDP per capita income

growth in 1990 to 1994 remained between 2 to 3 percent before it declined to minus 8 percent in 1995 (Exhibit 3.1).

The 1994 and 1995 financial crisis was attributed from investors divesting their holdings of government debt due to perceived risk from the political assassination of one of the presidential candidate in 1994. It generated a massive selling by the public resulted Mexican central bank left with depleted reserves. The unsustainable situation caused President Zedillo to abandon fixed exchange rate and devalue of peso (Allen, 1999, pp62-64). After the 1994 Mexican crisis, Mexican President Zedillo implemented privatisation plan by allowing private investment in railroads, satellites, telecommunications sector, as well as allowing foreign investors to hold substantial equity in domestic banking (Allen, 1999, pp 70-73).

In 1996, the economy managed to rebound to 3.5 percent growth after the government secured credit facility of USD 13.3 billion from IMF. GDP per capita continue to grow to five percent in 1997 before sliding to 2 percent in 1999 as result of contagion affect from Asian financial crisis as investors pulled away from investing emerging economies. In 2001, Mexico growth remained at minus one percent before rebounding to reach 3 percent in 2004.

#### 3.2.4 Chile

In 1973, Chile experienced recession as GDP per capita growth declined to minus 7 percent (Exhibit 4.1), and inflation rose to 360 percent (Exhibit 4.2). During that period, Chile faced numerous uncertainties as the financial sector was undergoing restructuring. The economy was starting to be liberalised and there was a change in government leadership, in which a new military government seized into power headed by General Augusto Pinochet. The new government began to index wages against inflation, in which lower wages bracket were readjusted proportionately greater than the higher wage

bracket. New open market policies were introduced by privatising and deregulating the banking sector as well as liberalising the interest rates. Capital movement restriction that was previously imposed was lifted. Lower and simplified import tariffs were implemented, in which all the tariffs did not exceed more than 35 percent (Ffrench-davis, 2002, pp53-60).

Chile's economy recorded growth of 7 percent in 1977 until 1980 before experiencing a financial crisis in 1982 (Exhibit 4.1). In 1981, the government introduced new savings policy by requiring workers to contribute 10 percent of their salaries into privately held pension fund. Its purpose was to increase the savings rate of the entire population as well as increase the pool of investment fund (Feldstein, 1998, pp33-40)

In 1982, financial crisis hit Chile as the banking sector face problems of underperforming loans due to disbursing huge amount of loan without proper procedures and monitoring. By 1984, a large number of banks declared bankrupt and were bailed out by the government (Valdes, 1995, pp163-164). The government then decided to recapitalise the banking sector and re-privatise a few of them and as a result the banks began to show profitability again. The government also privatised the public utilities and other private companies that were nationalised by the government during the 1982 and 1983 crisis. The maximum level for import tariff was reduced from 35 percent to 15 percent (Valdes, 1995, pp170-172).

In 1982, GDP per capita growth was at minus 12 percent before rebounding to 6 percent growth in 1984 after the government recapitalize the banks (Exhibit 4.1). The increase in growth was also attributed to increase demand for exports of fresh fruits and manufactured of goods (Ffrench-davis, 2002, pp53-60). Manufacturing output over GDP has increased from 18 percent in 1982 to 24 percent in 1984 (Exhibit 4.3).



In 1990, Chile experienced a slowdown in economy with 2 percent GDP per capita growth rate (Exhibit 4.1) and faced with burgeoning deficit resulted from bailing out the banks. New government privatization plan were accelerated with new fresh approach that emphasised on greater transparency, open competitive bidding, and fair pricing to safeguards government property. New sets of rules and regulations were also being introduced to strengthen the privatisation plans (Valdes, 1995, pp 163-165).

By 1991, GDP per capita growth has rebounded and peaked at 10 percent by 1993 before it declined to 4 percent as the government decided to restrict the growth to prevent from overheating (Exhibit 4.1). GDP per capita growth rose to 9 percent in 1995 before declined to minus 2 percent in 1999 due to lower export and investors shying away from investing in emerging market. In 2000 until 2003, Chile enjoyed positive growth between 2 to 4 percent (Exhibit 4.1).

### 3.2.5 Venezuela

Venezuela's economy is heavily dependent on oil production. When the price of oil increased, the country's GDP per capita growth would also increase. In 1973 and 1974, as the price of oil increased, the government started to spend considerably on public programmes, including health care, education, transport, and food subsidies (Salimano, 2005, pp292-295)

The GDP per capita growth peaked in 1976 at 4 percent before declining gradually into recession at minus 7.4 percent growths in 1980 (Exhibit 5.1). The decline in growth in 1980 was associated with steep increase in inflation to 22 percent (Exhibit 5.2). The economy managed to rebound in 1986 when it registered GDP per capita growth rate at 4 percent.

The growth remained relatively unchanged until 1998 before declined to minus 11 percent in 1989. The deep recession was due to mounting debt as a result of loss revenue from decline in oil price and high

subsidies provided to maintain state enterprise (Salimano, 2005, pp 292-300). IMF has extended credit facility to Venezuela to the tune of nearly USD20 billion from 1989 to 1996, with the first disbursement at USD 1 billion in 1989 (Exhibit 5.3). As a pre-condition to IMF structural credit facility, the government pursue path of economic liberalisation, financial restructuring, devaluation of peso and privatisation of state enterprise (Di John, 2009, pp108-115). At the same period, Venezuela was undergoing hyperinflation which reached 85 percent. In 1990 and 1991, Venezuela recorded a positive growth of 4 and 8 percent, respectively, before undergoing a cyclical growth patent again (Exhibit 5.1). Its growth was negatively affected due to rising inflation in 1993 at 38 percent before reaching 100 percent in 1996.

In 2003 the economy underwent recession again with GDP per capita growth recorded minus 11 percent mainly due to political upheaval that affected uncertainties in the economy (Exhibit 5.1) (Di John, 2009, pp77 and 108). The economy deteriorated as the price of oil hit bottom and inflation rose to 31 percent (Exhibit 5.2). In 2004, the economy grew and recorded GDP per capita growth at 16 percent. The high growth was mainly due to steep rise in world oil price.

### 3.2.6 Columbia

During 1970s, Columbia economy, like any other Latin American economies, was based on import substitution industrialisation. In early 1970s, GDP per capita fluctuated between 3 to 4 percent until 1975 before the growth slumped to minus 0.1 percent (Exhibit 6.1). It increased to 2.4 percent and 6 percent in 1976 and 1978, respectively, buoyed by the increased in world coffee price. However by 1981, GDP per capita growth dropped to 0 percent due to world recession causing weak demand for its domestic exports.

From 1981 to 1985, GDP per capita grew between 0 to one percent only (Exhibit 6.1) with high inflation rate. The high inflation was attributed to few factors, i.e. unrestricted spending by the government in the face of budget deficit, frequent devaluation of the peso and market re-adjustments to the wage structure (Edwards, 2001, pp27-40).

From 1986 to 1990, the GDP per capita grew between 3 to 4 percent due to increase coffee production (Exhibit 6.1). By the middle to late 1980s, Columbia coffee was in demand due to poor coffee harvest in Brazil from severe drought. It also benefitted Columbia as the coffee price increased at the same time. The export boom generated a large increase in foreign exchange, which increased the value of the peso and the price of domestic goods (Homes et al, 2008, pp43-47). It triggered inflation as it reached 30 percent in 1990.

The government decided to curb inflation by transferring the windfall profit generated from the rise in coffee export to government agencies that were experiencing budget deficit (Edwards, 2001, pp45-49). However, the measure did not curb the inflation from rising.

GDP per capita growth during the 1990s shows mixed signal as it fluctuated erratically between 4 percent in 1990 and 0 percent the following years with peaks at 3 percent and 4 percents in 1992 and 1994, respectively (Exhibit 6.1).

In 1990, the government decided to introduce new economic policies rooted on privatisation, deregulation and liberalisation. President César Gaviria Trujillo (1990-94) instituted tariff reductions, financial deregulation, privatization of state-owned enterprises, and adoption a more liberal foreign exchange rate (Edwards. 2001, pp42-55).The new economic restructuring plan was known as "aperture" or opening. However, by 1996 to 1998, growth dropped to 2 percent as the central bank tightened

monetary policy (Exhibit 6.1) and privatisation has slowed down as investors lost confidence due to inefficient bureaucracy, and security concern.

In 1999, the economy faced recession due to lack of global demand (Homes et al, 2008) with growth at minus 6 percent growth, before per capita growth rebounded to one percent in 2000. The recession resulted growing deficit with total foreign debt at the end of 1999 was at \$34.5 billion. The government received USD2.7 billion loans from IMF in exchange to committing towards balance budget and structural reforms (Exhibit 6.2).

### **3.3 MIDDLE EAST AND NORTH AFRICAN (MENA) REGION AND PROXIMITIES**

#### **3.3.1 Saudi Arabia**

Saudi Arabia's economy is literally based on production of oil that comprises 90 percent of its export earnings and 75 percent of budget revenues. Oil was found in 1936 and currently Saudi Arabia is the leader producer of oil. It has one quarter of world oil reserves and currently produced by the government oil company, named Saudi ARAMCO (Wilson, 2004, pp3-6).

In 1967, war erupted between Israel and Arab countries, resulted in the increased in world oil price. During that period, Saudi Arabia experienced windfall revenue that led to increase in GDP per capita growth of 8 percent in 1970 to nearly 22 percent by 1974 (Exhibit 7.1). Due to increased revenue, inflation rose from 0.2 percent in 1971 to 34 percent in 1975 (Exhibit 7.2). During that period, there was rapid growth in construction industries with new cities and towns growing rapidly. The rapid expansions in urban areas were mainly concentrated in 10 major cities with growing middle class population (Wilson, 2004, pp 40-46).

In 1976, GDP per capita growth decline from 7 percent to minus 7 percent in 1978 with inflation also declined from highs of 32 percent in 1976 to minus 1.6 percent in 1978 (Exhibit 7.2). By the end of 1979, GDP per capita growth rebounded to 4 percent due to increase in oil price from shortages in world oil production from Iran and Iraq war. The oil price rose from \$14 per barrel in 1978 to \$35 per barrel in 1981 (Exhibit 7.3). However, by 1982, Saudi Arabia per capita growth nose dived due to falling oil price. Saudi Arabia had to cut production from 9.82 million barrels to 6.48 million barrels per day or 35 percent decline. Saudi Arabia further cut its production to 2 million barrels per day by 1985. The government also had to cut some of its current account and capital spending, partly by delaying projects and also by cancelling some programmes (Cordesman, 2003, pp24-34).

Per capita growth remained low from 1985 to 1990 even though the trend is improving (Exhibit 7.1). By 1988, GDP growth improved as the oil price was slowly recovering. In 1990, the US-Iraq war created worldwide oil shortage, which benefited Saudi Arabia economy. By 1991 and 1992, per capita growth reached 8 and 9 percent, respectively. However, between 1992 and 2000, the per capita growth in Saudi Arabia remained steady between 0 to 3 percent as the price of world oil stabilised.

### 3.3.2 Egypt

From 1970 to 1973, GDP per capita growth in Egypt declined from 3.4 percent to minus 2 percent. However, after the Arab-Israel war that lasted from 1967 to 1973, the Egyptian economy grew quite rapidly. It grew to 7 percent in 1975 and 12 percent 1976, however, declined to 3.5 percent in 1978 (Exhibit 8.1). In 1973, the government introduced open market policy called “Infitah” to attract foreign investment and encouraged private sectors to take the leading role in investment. As most of Arab countries became wealthy from oil price increase, the government was able to attract substantial investment from the region. The growth was also boosted by the opening of Suez Canal as a source of

revenue that increased remittances and investment from Arab nations (Ikram, 2006, pp 52-60). In 1980, GDP per capita growth grew to 8 percent in 1980 before slowing down from growing deficit as a result financing the growing public sector expenditure and declined from investment overseas.

Inflation has risen since influx of foreign direct investment from other Middle East economies enjoyed from the increased in oil price. Inflation increased from 2.1 percent in 1973 to 10 percent in 1979 before peaking at 20 percent in 1980 (Exhibit 8.2)

Beginning 1981, most developing countries experienced slow growth due to weak demand for their goods from developed countries. Egypt GDP per capita growth was at one percent in 1981 before rising to 7 percent in 1982 and gradually decreased to reach 0 percent in 1986 (Exhibit 8.1). The slump in oil price not only affected its oil export revenue, but also lesser revenue from tourism, Suez Canal collection, and workers' remittances taking their toll on GDP per capita growth

Inflation has been rising upwards since it declined in 1982 to 10 percent (Exhibit 8.2). Early 1990's, the government introduced reforms such as liberalizing exchange and interest rates however, it did not go beyond making structural changes to the public sector and GDP growth dipped to minus one percent in 1991. Since there were no substantial major reforms instituted such as restructuring the public sector, it did not have significant impact on attracting further investment.

Egypt managed to obtain debt relief from loan payment by Paris Club as a token of appreciation for its effort during the Gulf war. Paris Club is an informal group from 19 of the world's richest countries, which provides financial services such as debt restructuring, debt relief, and debt cancellation to indebted countries and their creditors. Egypt also received monetary arrangement from other Arab nations for its help during the Gulf war. The Egyptian government signed an economic stabilisation programme with

the International Monetary Fund in May 1991 and a structural adjustment programme with the World Bank in November 1991(Ikram, 2006, pp 68-75).The debt relief from Arab nations, IMF and World Bank managed to stabilised GDP growth between 2 to 4 percent from 1992 to 1997 (Exhibit 8.1). Only in 1998, during the Asian financial crisis, Egypt per capita growth took a slight dip before recovering at 4 percent in 1999.

In 1999, after the Asian financial crisis, Egypt per capita income growth stood at 4 percent before declined to one percent by 2002 (Exhibit 8.1).

### 3.3.3 Turkey

Turkey's economy has been traditionally based on import substitution policy, where it subsidises numerous state enterprises. In the 1970's, Turkey was caught unprepared when the oil price rose, resulting the government to issue short term debts to international lenders to finance oil imports (Lovatt, 200, pp 4-8). By the end of the decade, Turkey was facing with high inflation rate which peaked at 110 percent in 1980 and thus unable to service outstanding loan (Exhibit 9.2). Debt service over GNI jumped from 7 percent of export to 36 percent in 1980 (Exhibit 9.3). During the first half the 1970's decade, GDP per capita growth was erratic with sharp peaks followed by steep declined. The per capita growth shot from one percent in 1970 to five percent by 1972 before sliding to one percent in 1973 due to oil crisis as Turkey had to import oil from neighbouring countries (Exhibit 9.1). It rose rapidly and peaked at 8 percent by 1977 before succumbing to steep declined in 1979 to minus five percent, due to crisis in debt repayment.

Inflation rose gradually from 7 percent in 1970 to 17 percent in 1976 before escalating into hyperinflation of 110 percent in 1980 due to Turkey's huge debt and rising oil price. The higher

unemployment experienced during the 1970s caused large number of Turkish people to migrate elsewhere, which boosted its remittance coffers (Exhibit 9.5). In 1979 and 1980, Turkish economy is characterised with huge debt problem and overhanging high inflation.

The government then decided to embark on liberalisation strategy by implementing several policies to address the balance of payment problem. It includes devaluation of Turkish lira and enactment of flexible exchange rates; tighter control on money supply and credit; restrictive public sector spending; and encouragement of overseas investment. All the measures were taken as part of Structural Adjustment loan from World Bank (Lovatt, 2001, pp10-20). The policies were successful as it managed to bridge the balance of payment and propel the per capita income growth from minus five percent in 1980 to 7 percent by 1987 (Exhibit 9.1). Inflation rapidly declined from 120 percent in 1980 to 37 percent by 1981. From 1981 to 1987, Turkey utilised IMF credit facility between USD 700 million to USD 1.5 billion each year to fund its economy (Exhibit 9.4).

During the Iraq war, 1989-1991, Turkey lost substantial pipeline revenue caused by oil flow disruption from Iraq through its Kirkuk pipelines to be exported overseas (Barth and Hemphill, 2000, pp 12-14). Saudi Arabia, Kuwait and United Emirates decided to compensate Turkey for the losses in revenue. In 1989 GDP per capita growth was at 0 percent but rebounded aggressively to 7 percent in 1990 (Exhibit 9.1). From 1989 to 1993, the government embarked in borrowing short term loans from the international market to finance public expenditure and pay the civil servants salary increase (Barth and Hemphill, 2000, pp14-18). As a result, the GDP per capita growth plunged to minus 7 percent in 1994 (Exhibit 9.1) and 76 percent loss in value of lira against dollar from mounting debt. The collapse of the exchange rate caused losses in public confidence resulting substantial capital outflow.



By 1997, the growth rebounded to five percent due to stronger export from improve demand overseas, increased tourism and increased bilateral trade with Soviet Union. However, it dropped to minus 7 percent in 1999 due to several factors, mainly the devastating earthquake at Marmara region, higher interest payment on Treasury Bill and contagion effect from Asian financial crisis (Togan and Hoekman, 2005, pp3-10). IMF came to rescue by extending USD 760 million loan facility (Exhibit 9.4) and Turkey began its stabilisation programme, which incorporated crawling peg exchange rate policy.

In 1999, per capita growth registered minus 8 percent growth before rebounded to 6 percent in 2000, but plunging again to minus 9 percent in 2001 (Exhibit 9.1). The short lived growth was due to strong demand for its products domestically and internationally, however, the short-lived growth was tampered with Turkey's growing problem servicing its debt. IMF provided a loan facility of USD 16 billion with condition that the government commitment to float the exchange rate and eradicate the inflation (Togan and Hoekman, 2005, pp3-10). By 2002, the GDP per capita rose again to 6 percent in 2002.

### 3.3.4 Israel

During the 1970s until middle of 1980s, Israel underwent a period of stagflation, characterised by low growth, rising unemployment and rising inflation. After the 1967 to 1973 Arab-Israel war, expenditure for defence and public sectors increased, mainly to maintain high employment and achieve social and political objectives. With increasing deficit, the government decided to reduce subsidies and devalue the currency, which resulted in increase in price for imported products. In addition, the Bank of Israel exacerbated the problem by printing more money to finance the growing expenditure, which triggered higher inflation (Barkai and Liviatan, 2007, pp171-175).

After the war in 1973, GDP per capita growth dropped to 0 percent due to increase in oil price as Israel was net importer (Exhibit 10.1). In 1974, with GDP per capita growth at 4 percent, shekel or Israel currency was devalued to contain the growing inflation (Exhibit 10.1). Huge deficit and inflation have caused negative impact to the fledgling economy as GDP per capita growth declined to minus 2 percent in 1977. In the same year, a new ruling party introduced a new liberalisation policy by easing capital flow and changing the exchange rate system from crawling peg to free float. It caused further devaluation as well as increased inflation (Eckstein and Ramot-Nyska, 2008).

In 1980, GDP per capita was at 4 percent before slumping down to 0 percent in 1984 (Exhibit 10.1). The economic situation deteriorated with inflation reaching an annual rate of 374 percent and Israel was in the brink of bankruptcy due to non-payment debt. In July 1985, the government adopted the “Economic Stabilisation Policy”, which consisted of several policies. Firstly, the exchange rate was devalued by 18 percent. Secondly, the domestic price was allowed to rise to 17 percent before it is being frozen. Thirdly, the subsidies were reduced as well as tax was increased. Fourthly, the Israel Central Bank kept a tight rein on the money supply (Eckstein and Ramot-Nyska, 2008). After the implementation of these policies, GDP per capita rose rapidly from 0 percent in 1984 to 6 percent in 1987 before plunging to 0 percent again in 1989 due to restrictive monetary policy instituted after the 1985 stabilisation programme (Exhibit 10.1).

Inflation was already at all time high when it reached 130 percent in 1980 (Exhibit 10.5). It remained steady until 1983 due to the sterilization of exchange rate policy pursued by the government (Eckstein and Ramot-Nyska, 2008). However by 1983, the inflation skyrocketed from 146 percent to 374 percent in 1984 due to huge debt, high unemployment and unstable currency. After the institution of the 1985 Stabilisation programme, the inflation rate declined to 300 percent by 1985 and 48 percent by 1986

before re-stabilised at 20 percent in 1987 (Exhibit 10.2). The rate remained relatively the same until 1991.

By 1990s, Israel government decided to further liberalise the financial and the commercial sector by instituting several measures. Telecommunication, port and banking sectors were open for privatisation. Effective tariff rates for imported goods are cut to less than one percent. From 1987 to 2003, foreign exchange rate control was gradually abolished so that full convertibility of Israel currency (shekel) can be achieved.

One of the important milestones in 1990s was the influx of Jewish immigrants from former USSR countries that not only brought cheap labour but also professional skills as large number of them are highly educated (De Fiore, 1998). The other significant event was the signing of the peace process in Madrid in 1991 and peace treaty between Israel and Jordan that has helped to reduce Israel's economic isolation from its neighbours and opened up new markets for Israeli exporters further worldwide (Ben-Basat, 2002, pp78-87). The peace process encouraged an unprecedented inflow of foreign investment in Israel, and provided tremendous boost to the economic growth in the region.

In 1991, the GDP per capita growth stood merely at 1.4 percent and began to grow to 4 percent before declining to 0 percent in 1997 due to weak demand from the international market leading to Asian financial crisis (Exhibit 10.1). It rebounded to 2 percent in 1998 before recorded 6 percent jump on 2000. The starting of Intifada in 2001 and downturn in hi-tech industries in the early 2000 have adversely affects Israel economy as the per capita growth rate declined to minus 3 percent for 2001 (Ben-Basat, 2002, pp281-285). It then began to climb gradually and recorded 3 percent growth by 2004.

### 3.3.5 Morocco

Morocco's economy is heavily reliant on tourism which contributes to half of its GDP and industrial output, while phosphate mining, construction and manufacturing contribute a quarter of GDP.

Agriculture contributed 14 to 20 percent of the country's GDP, but it employed 40 to 50% of the working population in the country (Exhibit 11.2). Since most of the cultivated crops were dependent on the rain fall, the agriculture productivity was very seasonal as it depended on the condition of the climate. Per capita growth was very inconsistent as the country's GDP was dependent upon the seasonal nature of the agriculture harvest. In certain periods, GDP per capita could rise up to 8 or 10 percent per year and other years, it would plunge to minus 5 or minus 8 percent (Exhibit 11.1).

Morocco was considered a major world producer of phosphate. When the price of oil increased, it negatively affected the country's GDP per capita growth. Since the price of phosphate also skyrocketed, the profit generated from exporting phosphate enable the government to finance the adverse effect of the rising oil price, which they imported. In 1976, Morocco enjoyed a period of high growth with GDP per capita income peaked at 8 percent due to escalating phosphate price as the price increased from USD14 to USD42 per ton. The Moroccan government then decided to pursue expansionary fiscal policy by increasing civil servant salaries and subsidies for basic consumable items. As the world price of phosphate fell and the Moroccan government pursuing expansionary policy, its economy began to experience growing budget deficit. By 1979, Morocco's GDP per capita growth stood at 2.2 percent with oil and phosphate price increasing concurrently, however, the revenue generated unable offset the growing government deficit (Lawless and M. Findlay, 1984). By 1981, the GDP per capita fell to minus five percent as the country faced with growing deficit, mainly due to soaring oil price, high interest rate, rapid appreciating dollar and failure by the government to reduce the country's expenditure. GDP growth

fell to 3 percent in 1983 as the country was burdened with high deficit (Exhibit 11.1) and in 1984 IMF granted loan worth USD200 million.

Prior to 1985, Morocco pursued an economy based on import substitution and control by the government directive. Financial system was heavily regulated and interest rates were repressed. Monetary policy was conducted primarily through the directive of the government. The government has major interest in various key sectors and they provided favourable credit terms to these sectors. The objective was to develop large public enterprise sector, including financial institutions (Nsouli, 1995, pp11-20). Austerity measures were adopted, in which subsidies were eliminated, wages were frozen, and public investments were reduced.

In 1987 to 1995, Morocco government pursued financial reform, in which the main objective was to reduce direct intervention by the government, liberalise interest rates, enhance the effectiveness pursuing monetary policy, and promote competition among banks (Nsouli, 1995, pp11-12). From 1987 and 1992 the per capita GDP plunged to minus five percent and minus 6 percent as it experienced one the worst drought for years. The per capita growth also was affected due to the Gulf war during the early 1990s as it affected the tourist industry badly. The following years in 1990s the economy experienced erratic growth as the drought took toll on the agriculture products, and declining demand for agriculture products (Exhibit 11.2). Slow pace in opening up the economy hampered it from experiencing consistent growth for a period of time. It was reflected by minus 8 percent per capita growths in 1995 followed by positive 10 percent growth the following year (Exhibit 11.1). From year 2000 until 2006, the GDP per capita growth was still showing erratic fluctuation but at a lesser degree as the growth jumped to 6 percent in 2000 and plunge to 2 percent in 2006. All these are attributed to the seasonal climate that has significant impact on the agriculture production.

### 3.3.6 Tunisia

Tunisia's economy is mostly dependant on oil, phosphate, agriculture and tourism receipts with most of its exports are shipped to EU nations. In 1970s, the country was under the directive or "Dirigiste" economic system, in which subsidies were given to preferred state enterprises (Hassan, 2005).

In 1972, Tunisia enjoyed extremely high GDP per capita growth of 16 percent due to the increased oil price (Exhibit 12.1). Due to the surplus in the receipt of oil revenue, Tunisia was able to subsidise the underperforming state enterprise for several years under pretext of "dirigiste" economic system (Hassan, 2005). GDP per capita experienced a minus 2 percent decline in 1973 before rebounding to five percent in 1974 and maintain for several years until 1980 (Exhibit 12.1). The GDP was at 4 percent between 1983 and 1985 before balance of payment crisis hit Tunisia. As the price of oil plummeted with growing number of sectors being subsidised, the government began to face soaring budget deficit. The economy deteriorated further as Tunisia was hit with severe drought and decline in tourism intake (White, 2001, pp 25-30).

In 1986, Tunisia signed for the IMF stabilisation and World Bank structural adjustment programmes in order to secure credit facility to fund their growing budget deficit. Under the IMF and World Bank programmes, Tunisia agreed to liberalise its prices, reduce tariffs, and reorient itself towards market economy (White, 2001, pp12-15). In 1987, Tunisia installed a new leader through a bloodless coup. President Habib Ali Bourguiba was replaced by his prime minister, Zine El Abidine Ben Ali and the economy dipped slightly in 1988 to minus 2 percent due to political instability (Perkins, 2004, pp157-165). In 1996 Tunisia entered into an "Association Agreement" with the European Union (EU) which it agreed to remove tariffs and other trade barriers on most goods by 2008 (White, 2001, pp145-150).From

1988 onwards until 2003, the economy grew steadily with recorded growth between 3.5 to 6 percent GDP per capita, buoyed by its diversified economy and less reliance on agriculture.

Tunisia's inflation rate has been traditionally low with less than 10 percent (Exhibit 12.2). From 1984 until 1995, the inflation rate remained at high single digit, before it began to decline gradually to low single digit from 1996 to 2006.

### 3.3.7 South Africa

In the 1970s, the South African economy was heavily dependent on gold exports. In 1971, the Breton Woods currency convertibility to gold ended as the United States decided to abandon the Gold exchange standard. Gold price in the world market was thereafter determined by supply and demand, which would significantly affect the country's GDP per capita growth (Tarp and Brixen, 1996, pp5-10).

South Africa's GDP per capita growth was characterised by random fluctuation due to historical economic and political turmoil. In the first half of the 1970s, GDP per capita fluctuate between 2 to 4 percent before declined to minus 2 in 1976, due to increased in world oil price (Exhibit 13.1). Even in the late 1970s and early 1980s when the oil price was at its peak, South Africa managed to record a reasonable GDP per capita growth, even though it is net importer of oil. This is primarily due to soaring gold price recorded in 1980s. However, by 1983, the GDP per capita plunged to minus 4 percent due to rapid decline in gold price and drought that has affected the agriculture productivity (Exhibit 13.2) before rebounding to 2 percent in 1984.

In 1970s and 1980s, South Africa took substantial loans from foreign banks to finance its trade import and by 1985 it faced debt amounting to USD24 billion. In the mid 1980s, European Communities and United States imposed limited sanctions on South Africa for its apartheid's policy, resulting dwindling of

foreign investment into the country. A group of banks withdrew credit facilities and discontinued the existing credit line, which caused the government to default servicing its debt and plunge the economy into tailspin (Jones, 2002, pp31-43).

The economy, however, managed to claw back in 1988 by recording 2 percent GDP per capita growth before plunging again in 1991 and 1992 to minus 3 and minus 4 percent, respectively. This was due to economic uncertainty of previous economic sanctions, even though apartheid system has well been abolished and sanction has been lifted (Exhibit 13.1). From 1994 to 1996, new investment began to pour in and South Africa managed to record positive growth of one to two percent, from 1994 to 1996. In 1998, South Africa experienced a slight dip in growth to minus 2 percent due to the contagion effect from Asian financial crisis as investors began to divest their fund from emerging countries and the gold price declined to the lowest level since 1985 (Mc Neil, 1998). Since then, it has increased gradually and recorded 2 percent in 2000 and 3 percent in 2002.

### **3.4 ASIA PACIFIC REGION**

#### **3.4.1 India**

During the 1970s and 1980s, India's economy was based on inward looking policy of import-substituting industrialisation with high tariffs imposed on most imported goods to discourage foreign goods and services entering the country and competing against local products. Like most developing economies, most of India's major industries, such as mining, telecommunication, steel, and energy were nationalised. New licenses were required for starting up new companies, producing new products and expanding product capacities. Even, when companies were on the brink of bankruptcy, they have to get approval from the government to close them down (Srinivasan and Tendulkar, 2003, pp 4-10). Strict foreign exchange rate control was imposed to stop from illegal foreign exchange. Historically, India has a fixed



exchange rate system, where the rupee was pegged to the value of a basket of currencies of major trading partners (Srinivasan and Tendulkar, 2003, pp 112 and 122).

In 1973, OPEC oil embargo caused spike in oil price and threw the Indian economy into chaos. India had no foreign exchange reserves available to pay for the imported oil and the import bill was growing faster while export earnings remained sluggish (Srinivasan and Tendulkar, 2003, pp13).

In early 1970s, export earning only contributed 4 percent of GDP compared to 24 percent in 2006 (Exhibit 14.4). India experienced economic recession from 1972 to 1974 with the economy undergoing a period of stagflation with increase in oil price, slow manufacturing output, and high inflation between 17 to 18 percent (Exhibit 14.2). In 1975, GDP per capita grew close to 7 percent caused by sudden decline in inflation. Whenever inflation rose, GDP per capita growth would fall. The underlying reason for the inflation was production shortfall of certain commodities that resulted supply shortages. Since India depended on agriculture production, any irregularities in its output would have tremendous impact on its economy.

In 1977 and 1978, the industrial sector, which includes manufacturing, as well as construction, public utilities, and mining, registered increased output that drove GDP per capita growth to 5 and 3 percent in 1977 and 1978, respectively (Exhibit 14.1). However, the growth rate declined in 1979 due to increased in world oil price as India is net oil importer.

In the 1980s, per capita growth has been growing moderately between one to eight percent with the highest rate recorded was in 1988 at 7.4 percent. Even though in late 1980's, India's economy has been growing faster but it has been accumulating huge debt. During that period, the government led by Rajiv Gandhi eased restrictions on several areas, e.g. capacity expansion by companies, price controls and corporate taxes reduction. While this has increased the rate of growth, it also led to high fiscal deficits

and a worsening of current account (Srivasan and Tendulkar, 2003, pp20-25). In 1980, inflation stood at 16 percent before gradually declined to 8 percent in 1982 and relatively unchanged until 1988 (Exhibit 14.2).

Due to the worsening balance of payment at the end of 1980s, Minister Narasimha Rao and finance minister Manmohan Singh introduced economic reform in 1991. The major item in the reform is abolishing the “License Raj” (i.e. the investment, industrial and import licensing), abolishing public monopolies, allowing automatic approval of foreign direct investment in many sectors, restructuring capital markets, deregulating domestic business, and reforming the trade regime (Gupta, 2008).

The GDP per capita income grew slowly from minus one percent to 3 percent in 1993 due to recent transformation to a more liberalise and open economy (Exhibit 14.1). By 1994 to 1996, the country grew from five percent to 6 percent, before growth declined in 1997 due to bottleneck in the country’s infrastructure, low manufacturing productivity and high level of debt (Kaushik, 2004, pp20-24). It then rebounded in 1998 to five percent before declining in 2000 until 2002. Since 1990, the inflation had begun to slowly receding from highs of 14 percent to 10 percent by 1994 before declining further down to 6 percent in 1998 and 3 percent by 2000 (Exhibit 14.2).

GDP per capita growth rate from 2000 and 2003 was growing rather slowly around 2 to 3 percent, but by 2003 to 2006, India was experiencing high growth at 7 to 8 percent. It reflected by the influx of growing capital investment into the country and the contribution of the service and manufacturing sector towards the per capita GDP growth. Service and manufacturing sector has been growing between 7 to 11 percent each year from 2002 to 2006 (Exhibit 14.5 and Exhibit 14.6). Foreign direct investment grew from merely USD 5.6 billion in 2002, which is one percent of GDP, to USD22 billion in 2006, which is 2 percent of GDP (Exhibit 14.3).

### 3.4.2 Republic of Korea (South Korea)

South Korea, since the middle of 1960s, has decided to restructure its economy to become export oriented country due to its lack of natural resources and insignificant domestic market. The government played a key factor in planning the country's long term strategy. During the earlier period, South Korea industry was largely based on producing low-value-added and labour intensive products, e.g. textiles, silk, and plywood, which faced stiff competition and protectionism from other import developing countries.

By middle of 1970s, the government decided to restructure the manufacturing sector by transforming the industry from producing low-value-added products into high-valued-added and capital intensive industries (Yi, 1996, pp10-25). In the early 70s, the country enjoyed phenomenal growth rate, which exceeded more than five percent except in 1972, and 1980. In 1972 the growth was adversely affected by high cost of oil import. GDP per capita growth started at around 6 percent in 1970 before declined to 2 percent in 1972 due to rising oil price.

By 1973, it managed to grow at a phenomenal growth rate of 10 percent (Exhibit 15.1). In 1975, GDP per capita growth stood at five percent before jumping to 9 percent in 1977. It declined to minus 3 percent in 1980, mainly because of rise in oil price and the political disturbance resulted from the assassination of President Park Chung Hee (Bedeski, 1994, pp36-39).

Inflation rate was rather erratic as it started at 16 percent in 1970 before plunging to 3 percent in 1973 (Exhibit 15.2). The decline in 1973 inflation was the result from the actions by the government raising taxes on oil imports, expanding investments, increasing exporting goods to Middle East and increasing foreign borrowing (Yi, 1996, pp19-23; Dornbusch and Fischer, 1993). By 1975 and 1975, inflation rose again to 24 and 25 percent due to wage increased and importation of capital goods. In 1977, it declined to

10 percent as the government imposed tight monetary and fiscal policy, as well as controlling the prices on certain staple items (Exhibit 15.2). However, it rose again the following year, and reached peak of 28 percent in 1980 despite the effort by the government to tighten the fiscal and monetary policy. The inflation peaked in 1980 due to the socio-political unrest resulted from the assassination of President Park (Dornbusch and Fischer, 1993).

In 1980 when the GDP per capita growth plunged to minus 3 percent in 1980, the economy was lethargic with growing foreign debt and high inflation. The government then decided to take the initiative by driving up export and manufacturing output (Yi, 1996, pp24-28) and it led to GDP per capita to grow rapidly to 9 percent in 1983. In 1987, it grew to 10 percent due to vast infrastructure expenditure undertaken in preparation to host 1988 Olympics (Exhibit 15.1). However, it slowed down in 1989 amid the slowdown in the global recession.

Inflation rate in 1980 was 29 percent before it plunged steeply to 7 percent in 1980 and 2 percent by 1984 (Exhibit 15.2). The dropped in inflation from 1981 to 1982 could be attributed to low energy and raw material prices, the depreciation of the US dollar and low interest rates. In addition the government began to pay more attention to price stability, and labour productivity outstripped the growth of wages (Dornbusch and Fischer, 1993). Inflation rate remained steady until 1987 before rising again to 7 percent in 1988 leading to Olympics game as the inflation was driven by material imported for construction (Exhibit 15.2). In 1989, it dipped slightly to 8 percent before rising again to 9 percent in 1990. Early 1990s, the GDP per capita growth slowed down to five percent in 1992 to 1994 due to government easing the growth to contain the inflationary pressure as it was peaking to 9 percent in 1991. However, due to the weak growth appearing in other Asian countries, who were major recipients of Korean export products, the GDP per capita declined in 1996 before plunging to minus 8 percent in 1998.

During that period, South Korea was burdened by huge foreign debt, declining import, increasing interest rate and bankruptcy to 8 of the 30 biggest major conglomerates or “Chaebols”(Chamberlain, 2001, pp104-108). Gross foreign debt had increased to \$105 billion by the end of 1996, almost double that in 1994 and equivalent to 20.1 per cent of GDP, compared with around 12.6 per cent of GDP at the end of 1990. By then, Korea had to borrow from IMF and have to adhere strictly to restructuring of their financial system. These reforms included significant changes in the financial institutions system, the corporate sector, the labour market and government regulations (Chung and Eichengreen, 2005, pp4-10).

By 1999, the GDP per capita skyrocketed to 9 percent growth due to growth in production output by 11 percent; however it slowed down in 2001 caused by the delayed in public funding that was supposed to be infused into the working capital of the Chaebols and also due to labour unrest. It then rose to 6 percent growth in 2002.

Inflation rate remained relatively consistent in the 1990s at around five percent except in 1998 when it increased to 7.5 percent (Exhibit 15.2). The inflation was derived from capital goods importation. However, in 1999, the inflation rate dropped significantly to one percent due to government drastic curtailment on imported capital goods as well as adherence to IMF strict conditions of the need to generate surplus balanced of payment. This surplus generated derived from curtailment of imported goods equivalent to 13 per cent of GDP (Chung and Eichengreen, 2005, pp9-14). As the economy began to recover and more capital goods are imported for investment purposes, inflation began to rise again to reach 4 percent in 2001 before easing to 3 percent the following year (Exhibit 15.2). The increase in 2001 was due to higher oil price, increase public service charges, and higher prices for farm livestock and fisheries products.

### 3.4.3 Philippines

During the 1970s, Philippine adopted import substitution strategy and the domestic manufacturers obtained financing from international borrowers. The economy was mainly based on export oriented low value products and most of the raw materials have to be imported (Canlas et al, 2009, pp2-29).

GDP per capita growth started at one percent in 1970 and peaked again at 6 percent in 1976. During the 1977 and 1978, electronics and garment increased their production for export, which indicated by moderate growth in manufacturing output between 4 to 6 percent (Exhibit 16.3). In 1980, IMF provided USD 200 million loan under Structural Adjustment Loan programme (SAL), in exchange the government has to liberalise the interest rate and exchange rate system, open the trade barrier and reduce the import tariff (Baliscan and Hill, 2003, pp80-84). GDP per capita growth stood at minus 0.6 percent and began to decline in 1984 and 1985 to minus 10 percent as the economy was declining due to political upheaval and overthrowing of President Ferdinand Marcos.

GDP per capita growth managed to recover to one percent in 1986 and increased to 4 percent by 1988 (Exhibit 16.1). The growth was resulted from the government expansionary fiscal policy and also due to increase consumer demand. From 1989, it began to drop from 4 percent to minus 3 percent in 1991. The economy deteriorated as the debt kept growing, thus the government decided to tighten monetary policy to avert from further crisis.

In 1991, the economy was experiencing severe recession due to major earthquake in 1990 and attempted coup (Baliscan and Hill, 2003, pp86-91). From 1991 until 1996, the economy gradually increase and reached 4 percent before the country engulfed by natural disaster from massive flooding, i.e. El Nino effect in 1997 and the financial crisis in 1998. The economy declined and suffered recession with minus 3 percent growth before recovering to reach 4 percent growth in 2000. However, it declined again in 2001

to 0 percent due to a major banking failure that caused losses in investors' confidence and also political turmoil from the impeachment of President Estrada. Global economic and electronics-demand slowdown combined with softer prices of resource-based commodities depressed export performance in 2001 (Baliscan and Hill, 2003, pp93-98). In 2001, Macapagal Arroyo took over to become President of Philippine and she managed to resuscitate the economy reflected by GDP per capita growth reached 4 percent by 2004 (Exhibit 16.1).

Inflation was at double digit figures from 1970 until 1986 except between 1975 to 1978 (Exhibit 16.2). It peaked in 1971 at 21 percent, 1974 at 34 percent from the rise in cost of oil import and 50 percent in 1983 due to escalating deficit that had caused difficulty to pay for imported goods. In order to avert the country from brink of bankruptcy, the IMF agreed in February 1983 to grant \$543 million emergency credit to the government. This was followed by a \$300 million credit from the World Bank and other credit of similar amount from major New York banks with significant interests in the Philippines (Canlas et al, 2009, pp39-45). Inflation managed to rise rapidly from 1986 to 1991, i.e. from one percent to 18 percent. The inflation rose due to several factors, mainly attributed to uncertainty in the economy as a result of 1989 fail coup attempt, low yield from agriculture from prolong drought and the eruption of Mount Pinatubo in 1991 that caused chaos in the economy. From 1992 until 2003, the inflation remained stable at single digit.

#### 3.4.4 Indonesia

Indonesia recorded a modest and consistent growth from 2 to 7 percent in 1970 until 2003, except for certain years, i.e. 1982 and 1998, when both recorded below zero percent. In 1970, agriculture contributes 45 percent of GDP (Exhibit 17.4), while manufacturing output contributed only 10 percent (Exhibit 17.5). By 2006, manufacturing sector contributed 27 percent, in contrast, only 14 percent by the

agriculture sector (Exhibit 17.4). During the 1970s, oil was becoming the main revenue generator to finance the countries public expenditure, especially after the oil boom (Thee, 2003, pp27).

GDP per capita growth peaked at 7 percent in 1970s before declining to 3 percent in 1976. It recorded 6 percent growth between 1977 and 1980 (Exhibit 17.2). In 1982, GDP per capita fell to minus 0.8 percent as the manufacturing growth slowed to one percent only. As the price of oil bottom up in 1986, Indonesia began to rethink ways to diversify its economic activities by attracting more foreign investments (Thee, 2003, pp99-104).

From 1986 until 1996, growth remained relatively modest between 4 to 6 percent. Between 1986 until 1989, the government decided to introduce financial and trade reform. The trade reform includes reducing tariff and licensing requirements while the financial reform includes banking sectors being deregulated and more banking licenses being provided. New rules are also being written to liberalise the capital market to attract foreign investors (Dick et al, 2002, pp235-244).

However, FDI inflow was insignificant prior to 1994 before it recorded two to three percent of GDP until 1996 (Exhibit 17.3). By 1998, Indonesia was in the midst of the financial crisis when GDP per capita growth dropped to minus 14 percent as the investors divested their investment and Indonesia was having difficulty servicing its outstanding debt (Exhibit 17.1).

GDP per capita growth managed to rebound to record 3 percent growth in 2000 before dipping to 2 percent in 2001. The slight dipped in 2001 was attributed to the late release of loan amounted to USD5 billion by IMF resulting delays in financing key projects to propel the country out of recession (Matsumoto, 2007, pp21-22)



Inflation mostly remained at single digit except for a few exceptional years when it rose rapidly in 1973 to 1976 from 11 percent to 41 percent (Exhibit 17.2). The inflation can be attributed to the rising world oil price even though Indonesia was a major exporter. Inflation also rose to 18 percent in 1980 because of the second spike in oil price. However, during the 1998 crises, inflation soared to 59 percent due to steep devaluation of its currency that caused imported goods to be very expensive.

#### 3.4.5 Thailand

In the 1970s, Thailand's economy was based primarily on agriculture production and import substitution economy. The country's other source of revenue derived from other sectors such as tourism, overseas remittances and light manufacturing, especially textile (Heenan and Lamontagne, 2001, pp41-45).

Agriculture contributed 26 percent of GDP (Exhibit 18.6), manufacturing only 16 percent (Exhibit 18.4) and service industry contributed the major portion which is 49 percent (Exhibit 18.5). GDP per capita income growth started strong in 1970 at 8 percent (Exhibit 18.1), however, it declined abruptly to 2 percent in 1971 to 1974

GDP per capita grew to 7 percent from 1976 to 1978 before declining to 3 percent in 1979 (Exhibit 18.1). The growth remained steady at 3 to 4 percent until mid 1980s before the government embarked on the policy of deregulating and liberalising the financial and trade sector (Hernández et al, 1999).

In 1988, import restrictions were removed on more products and in 1990 new policies on tariff reductions were introduced. Between 1990 and 1994, financial restrictions were slowly deregulated with the loosening control on savings accounts and lesser requirement imposed on capital reserved requirements on commercial banks. Also the restrictions on capital out flows were reduced to make it easier to remit money out of the country (Hernandez et al, 1999).

Inflation rose from 1976 at 4 percent to reach 20 percent in 1980 due to the rising oil price before falling again to one percent in 1984 when the oil price fell (Exhibit 18.2). Inflation remained relatively low during the 1980s. Even when financial crisis hit in 1997, inflation remained relatively low at 6 percent and dropped to one percent in 2000.

GDP per capita income growth fell to minus 3 percent in 1997 and further minus 12 percent in 1998 before rebounding to 3.5 percent in 1999. The main cause of the recession was attributed to the mass selling of Baht in the open market as the investors deemed Baht to be overvalued on several reasons. It was triggered by the decline in manufacturing output that resulted in reduced demand in exports, increased budget deficit and increased short-term debt by private sectors (Dixon, 2000).

Bank of Thailand attempted to support Baht by pegging it against US dollar, however the exercise failed, which forced the central bank to float the currency that eventually caused its value to collapse. It dropped from average 25 Baht per 1 USD to 41 Baht per 1 USD in 1998 (Exhibit 18.7). Subsequent panic ensued in the financial market as debtors unable to pay their loans and creditors unable to redeem their investment as the collateral plunged in value from decade-long overvalued property. Later, Thailand managed to recover from the recession at a slower pace between one to five percent from 1999 to 2002 (Exhibit 18.3) after IMF injected USD14.2 billion of loan bailout with strict financial and trade conditions. GDP per capita growth managed to rise in 2003 to 6.5 percent (Exhibit 18.1) driven by strong manufacturing output growth of 11 percent (Exhibit 18.4).

#### 3.4.6 Malaysia

Malaysian GDP per capita since 1970s has experienced a moderate growth between 3 to 7 percent growth, except for a few years when the economy grew unexpectedly high, and other years when it hit lows due to regional or global recession. In 1970 GDP per capita grew rapidly from 3 percent in 1971 to

9 percent in 1973. This was underpinned by a boom in export-oriented and labour-intensive industries, such as electronics, textiles, and wool products. According to the second Malaysia plan (1971-75), Malaysia has positioned its manufacturing sector into becoming export-oriented (Sivalingam, 1994, pp4-8). The essence of the plan was to attract FDI from large multinational corporations to relocate their manufacturing site in Malaysia to mainly produce electronic products and components. From 1970 until 1973, manufacturing sector registered double digit growth as it peaked in 1973 at 23 percent (Exhibit 19.5).

In 1974, the economy decelerated due to increase in oil price, thus Malaysia face mild recession in 1975. The economy managed to recover and grew at 9 percent by 1976 (Exhibit 19.2). From 1977 to 1984, Malaysia experience uninterrupted and moderate growth from 3 percent to 7 percent before the global economic recession adversely affected Malaysia. In 1986, GDP per capita growth dropped to minus 4 percent growths before rebounded in 1988 to 7 percent. From 1988 onwards, Malaysia recorded relatively high GDP per capita growth between 6 to 7 percent until the 1998 economic downturn when it dropped to minus 9 percent.

The prolonged high growth during the late 1980s can be attributed to several factors, mainly the increase influx of recorded FDI and GDI. FDI increased from USD423 million in 1989 to reached peaked of USD5 billion by 1993(Exhibit 19.4), or from 2 percent of GDP to 9 percent of GDP. The FDI inflow remained relatively high between USD 4 to USD 6 billion per year (Exhibit 19.4) until the economy experienced financial recession in 1997. GDI also increased from USD 6.7 billion a year to USD 41 billion by 1996 (Exhibit 19.7). From 1989 to 1995, GDI registered over more than 20 percent increased, except in 1992 and 1994, where it recorded 3.4 percent and 12 percent, respectively.

By 1998, Malaysia experienced currency crisis when a substantial outflow of funds from the actions of portfolio investors caused financial destabilisation in foreign exchange market, financial institutions and stock market. The government later on imposed selective capital control in order to restrict the outflow of local currency and pegged the currency in September 1998 at 1 USD to 3.8 Ringgit Malaysia (RM) to destabilise the currency (Exhibit 19.6) (Ghosh and Ariff, 2004, pp3-8).

In 1999 and 2000, the economy was again poised to move upwards on the growth path as it recorded 4 and 6 percent growth, respectively. However, in 2001, it dropped to minus 2 percent as GDI dropped to minus 4 percent and FDI dropped to 0.6 percent from 4 percent from 2000 (Exhibit 19.4 and 19.7). By 2002, the per capita GDP growth rebounded to 2 percent and peaked at five percent by 2004.

Historically, Malaysian inflation rate was below five percent in 1970s except in 1973 and 1991 when there was increased in world inflation (Exhibit 19.3). The low inflation was attributed to the government policy in controlling price on selected staple products. In 1972, inflation stood at only 3 percent, before rising rapidly, due to increase in the oil price, to 11 and 17 percent in 1973 and 1974, respectively. In 1981 it reaches 10 percent rate but fell below one percent as the oil price dropped to record lows from 1984 to 1987. Inflation has remained under five percent from 1987 to 2003, except in 1998 financial crisis when value of ringgit Malaysia fell to nearly 40 percent, resulted imported goods becoming more expensive. Inflation was recorded at 6 percent then, but fell in the subsequent years when the ringgit Malaysia was pegged to US dollar.

### 3.4.7 Singapore

Singapore spilt from Malaysia Federation in 1963 and during the inception the economy was mainly based on its role as entrepot for its neighbouring countries due to its strategic location in the Straits of Malacca (Bercuson and Caling, 1995, pp11-18).

In the early 1970s, share of manufacturing output commanded 23 percent of the country's GDP output only (Exhibit 20.3). Two to three percent of the GDP was from agriculture sector (Exhibit 20.11) while the rest from service sector, mainly Singapore's role serving as the main hub for import and export between its neighbouring countries with other regions. Its GDP per capita growth in 1970 started very high at 12 percent and maintained that level until 1972 before the onset of OPEC oil crisis in 1973 and 1974 that caused its growth to decline to 2 percent (Exhibit 20.1). It then rebounded to 6 percent growth in 1976 and rising to 8 percent in 1980. However, by 1982 its economy stuttered as its growth fell to 2.5 percent due to the world recession.

Since Singapore is an open economy, and most of its revenue was generated from import and export of goods and services, any world or regional economy slump would adversely affected Singapore, as reflected by the 1982 decline in its GDP per capita growth. In 1985, the economy was once again affected and the GDP per capita slowed to minus 1.6 percent growth due to recession originated from neighbouring countries (Exhibit 20.1). The countries' GDPs were adversely affected due to falling commodity prices, including oil, resulting lower business being traded via Singapore's port. Singapore's GDP per capita growth increased to 8 percent in 1988 before declined to 3 percent in 1992. The drop in the per capita growth was due to decline in merchandise import and export as it slumped from 327 percent in 1987 to lows of 273 percent in 1991 and 1992 (Exhibit 20.6).

GDP per capita growth then rebounded to 9 percent in 1993 before the economy slowed down in 1998 to minus five percent due to Asian financial crisis. However from 1996 to 1998, the currency was slightly affected as it depreciated from 1 USD dollar to 1.7 Singapore dollars (Exhibit 20.4). In 1999, it recorded 6 percent growth due to strong demand for its electronics and IT products. However, by 2001 the economy shrank again to minus five percent as the demand for IT and electronic products slackened as indicated by the manufacturing output falling to minus 12 percent in 2001 (Exhibit 20.5).

Inflation in Singapore historically was lesser than 4 percent except on certain years before 1982(Exhibit 20.2). The key determinant of inflation in Singapore were imported goods, hence Monetary Authority Singapore (MAS) able to curb inflation rate by regulating exchange rate by allowing it to fluctuate within an undisclosed band set against a trade-weighted nominal effective exchange rate (Stone, 2009, pp54).

### 3.5 SAVINGS DETERMINANTS BY REGION

#### 3.5.1 Private Savings

<b>LATIN AMERICA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
ARGENTINA	20.7	22.5	19.3	17.8	14.7	14.8	18.8
BRAZIL	24.1	26.3	22.2	22.1	17.0	14.8	15.5
MEXICO	17.8	19.5	24.7	19.6	15.2	17.9	17.1
CHILE	15.6	13.4	14.8	20.3	22.3	23.1	24.6
VENEZUELA	37.8	30.2	24.6	18.8	19.2	21.0	23.9
COLUMBIA	11.2	13.9	11.8	13.3	12.6	8.6	8.8
<b>Mean</b>	<b>21.2</b>	<b>21.0</b>	<b>19.6</b>	<b>18.7</b>	<b>16.9</b>	<b>16.7</b>	<b>18.6</b>
<b>Std Dev</b>	<b>9.1</b>	<b>6.5</b>	<b>5.4</b>	<b>3.7</b>	<b>3.8</b>	<b>5.2</b>	<b>5.9</b>
<b>SKEWNESS</b>	<b>0.9</b>	<b>0.2</b>	<b>-0.2</b>	<b>-0.2</b>	<b>0.9</b>	<b>0.0</b>	<b>-0.1</b>

**(Table 3.5.1.1 – LATIN AMERICA Private Savings)**

Private savings in Latin American economies have been declining from an average of 21 percent in the 1970-74 period to only 18.6 percent in the 2000-04 period. In Argentina, the private savings rate declined from 1991 until 2001 to 15 percent, as local currency were overvalued with Peso against US dollar remained stubbornly pegged at parity, resulting more people to consume imported goods rather than saved (Hornbeck, 2002). Savings rate decreased in Brazil in early 1990s as the government instituted the Real plan, which froze the price of most products and salaries as well as instituted price indexation. In Mexico, the government's measure of devaluing the currency has negative impact on savings in the early 1990s. The declined in savings in Columbia in early 1990s was mainly caused by the declined in agriculture growth output, especially coffee production (Exhibit 6.3). The standard deviations (SD) of savings among the countries over the thirty years have also declined indicating that savings gap among these countries has also decline. Even the skewness of the distribution indicates that the distribution has becoming more normalised from 0.9 in 1970-74 to zero in 2000-2004.

MENA	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
S. Arabia	62.4	46.6	28.6	3.7	17.5	20.5	27.6
EGYPT	1.7	-2.4	-0.6	-4.0	-0.9	-1.5	1.4
TURKEY	10.6	10.4	6.8	13.1	14.6	14.0	14.4
ISRAEL	18.7	15.5	15.4	16.7	21.7	22.9	24.4
MOROCCO	12.9	4.7	5.8	8.8	7.1	5.9	4.8
TUNISIA	29.9	30.3	31.8	32.4	25.1	22.9	20.8
SOUTH AFRICA	13.7	15.9	15.3	15.2	11.2	9.6	10.7
Mean	<b>21.4</b>	<b>17.3</b>	<b>14.7</b>	<b>12.3</b>	<b>13.8</b>	<b>13.5</b>	<b>14.6</b>
Std Dev	19.3	16.1	13.6	11.1	8.5	8.9	10.2
SKEWNESS	1.5	0.9	1.1	0.3	-0.3	-0.4	0.0

**(Table 3.5.1.2 – MENA Private Savings)**

Private savings in MENA, including South Africa and Turkey, have also declined from average 21.4 percent in the 1970-74 period to 12 percent by the 1985-89 period. However, the discrepancies between the high and lows indicated by the standard deviation (SD) is quite large, specifically in early 1970s with SD at 19 percent before narrowed down to 9 percent by 1990-94 period. It is mainly due to the Tunisia having an average savings rate of more than 25 percent as compared to Egypt with negative savings.

In Saudi Arabia, savings rate has declined from average 62 percent in the 1970-74 period to 4 percent in the 1985-89 period. Since the oil price peaked at USD\$37 per barrel in 1980, private saving never reach over the level of 50 percent that was typical during the 1970s. The savings decline in Turkey in the 1980-84 period was largely due to huge deficit and the overhanging high inflation. The high savings rate registered in Israel from 1990s onwards could be attributed to low and stable inflation rate that has caused real deposit rate to be positive. Depositors were more confident to save their money in the banks since they could earn positive return. Private savings in Morocco fluctuated within single digit between 3 to 9 percent from 1974 to 2006. The low saving rate (Exhibit 11.3) was mostly affected by the high rate



of inflation prevailing from 1974 until 1994 (Exhibit 11.4). In South Africa, after the economic sanction was imposed in 1989 in opposition to the country's upholding apartheid system, the private saving rate began to decline gradually beginning 1990 (Exhibit 13.3).

<b>ASIA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
INDIA	10.8	11.8	9.5	9.9	10.9	10.4	10.8
S. KOREA	14.8	27.2	29.6	38.1	39.5	39.8	37.3
PHILIPPINES	14.4	15.5	15.5	13.4	9.4	8.3	11.9
INDONESIA	16.7	22.4	23.7	23.0	22.0	20.7	17.2
THAILAND	27.6	26.6	25.9	29.8	35.1	34.2	28.8
MALAYSIA	21.8	27.3	24.5	29.5	29.0	37.4	38.3
SINGAPORE	42.3	46.6	53.1	50.2	53.0	56.2	50.1
<b>Mean</b>	<b>21.2</b>	<b>25.3</b>	<b>26.0</b>	<b>27.7</b>	<b>28.4</b>	<b>29.6</b>	<b>28.5</b>
<b>Std Dev</b>	<b>10.5</b>	<b>11.2</b>	<b>13.7</b>	<b>13.9</b>	<b>15.7</b>	<b>17.3</b>	<b>15.0</b>
<b>SKEWNESS</b>	<b>1.0</b>	<b>0.8</b>	<b>1.0</b>	<b>0.3</b>	<b>0.2</b>	<b>0.1</b>	<b>0.1</b>

**(Table 3.5.1.3 – ASIA PACIFIC Private Savings)**

Unlike the other two regions, savings in Asian countries has increased gradually from 21 percent in the 1970-74 period to 29 percent in the 2000-04 period. However, SD shows a wide dispersion between 10 to 15 percent between the countries. This reflects that certain countries, such as Singapore, Malaysia and South Korea have high savings rate, in which their savings have increased between 8 to 17 percent within the thirty years; in contrast India and Philippines rate remained stagnant. Their savings rate has remained low under 15 percent as compare to Thailand, South Korea, Malaysia and Singapore whose savings exceed more than 25 percent over GDP.

Private savings in India has been rather consistent since 1970 and has been registering 9 to 12 percent of GDP (Exhibit 17.6). Malaysian private saving over GDP has remained relatively high since 1970 at 22 percent. In 1991, Employee Provident Fund (EPF) was established to manage employees' retirement benefits via contribution from the employees and employers. The employees are obligated to contribute

certain fractions of their income into savings, while their employers will match the same or higher contribution into the employees' account (Ang, 2008). Since 1991, private savings rate has kept increasing until it reached 42 percent of GDP before declined slightly in 2001 to 37 percent (Exhibit 19.1).

Singapore level of private savings was high due to obligatory contribution imposed towards the employees and employers. Those in private sectors are obligated to enrol into social security scheme, called CPF, in which the employees are obligated to contribute certain percentages of their income, ranging from 13 to 25 percent. Meanwhile, the employers will match the employees' contribution by contributing between 20 to 25 percent into the scheme (Mun and Ying, 2009). The private savings started at 41 percent of GDP in 1970 and rose to 55 percent due to changes in the percentages of contribution by employee and employers subjected to the government rulings (Exhibit 20.1).

### 3.5.2 GDP Per Capita Income Growth

<b>LATIN AMERICA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
ARGENTINA	2.0	0.6	-1.6	-2.8	5.3	1.0	-0.6
BRAZIL	8.4	3.5	-0.9	2.5	-0.3	0.5	1.6
MEXICO	3.1	3.5	1.0	-0.8	2.0	1.4	1.4
CHILE	-0.2	1.9	-0.2	5.6	5.4	3.9	2.8
VENEZUELA	0.4	0.5	-4.7	-1.0	1.7	-1.1	-0.1
COLUMBIA	4.6	3.0	0.4	2.4	2.3	-0.4	1.8
<b>Mean</b>	<b>3.1</b>	<b>2.1</b>	<b>-1.0</b>	<b>1.0</b>	<b>2.8</b>	<b>0.9</b>	<b>1.2</b>
<b>Std Dev</b>	<b>3.9</b>	<b>4.5</b>	<b>5.0</b>	<b>4.7</b>	<b>4.1</b>	<b>4.2</b>	<b>5.4</b>
<b>SKEWNESS</b>	<b>-0.2</b>	<b>-1.3</b>	<b>-0.1</b>	<b>-1.0</b>	<b>0.0</b>	<b>-0.4</b>	<b>-0.2</b>

**(Table 3.5.2.1 – LATIN AMERICA GDP Per Capita Growth)**

GDP per capita growth for Latin America, as shown in Table 3.5.2.1, is moderate and remained slightly U shaped from 1970 until 2004. It began on average at 3 percent in the 1970-74 period and declined to

minus one percent in the 1980-84 period before gaining slowly to average one to two percent in the 2000-2004 period. Most of the Latin American economies were having problems with negative growth in the 1980s. Chile was the only economy that has shown improved growth in the 1980-84 period with growth rate of five percent and growing at modest rate until 2000. The distribution is slightly negative skewed, except in 1990-94 period, which indicates the modes are slightly to the left of the mean average in the distribution.

<b>MENA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
S. Arabia	16.4	1.1	-7.9	-4.1	1.8	-0.6	1.5
EGYPT	0.6	7.2	4.7	1.6	1.5	3.1	1.8
TURKEY	2.3	2.0	1.3	2.8	1.8	2.6	2.9
ISRAEL	5.1	0.8	1.7	2.0	2.8	1.8	0.8
MOROCCO	1.6	3.6	0.4	2.8	1.4	0.8	3.5
TUNISIA	6.2	3.7	2.0	0.1	2.9	3.7	3.6
SOUTH AFRICA	2.0	0.0	0.4	-1.0	-1.9	0.3	2.1
<b>Mean</b>	<b>4.9</b>	<b>2.6</b>	<b>0.4</b>	<b>0.6</b>	<b>1.5</b>	<b>1.7</b>	<b>2.3</b>
<b>Std Dev</b>	<b>6.2</b>	<b>3.8</b>	<b>5.3</b>	<b>4.0</b>	<b>3.7</b>	<b>3.6</b>	<b>3.0</b>
<b>SKEWNESS</b>	<b>1.4</b>	<b>0.3</b>	<b>-1.5</b>	<b>-0.6</b>	<b>-0.2</b>	<b>-0.3</b>	<b>-0.9</b>

**(Table 3.5.2.2 – MENA GDP Per Capita Growth)**

GDP per capita growth in MENA regions began higher than Latin American at five percent in the 1970-74 period and declined to averaged 0.4 percent in the 1980-84 period before climbing to 2 percent the 2000-04 period. The growth trend shows a U-shaped curve, which is similar to the Latin Caribbean regions. Saudi Arabia was the country that was hit hard by recession in the 1980s as their growth rate registered minus 8 percent in the 1980-84 period and minus 4 percent in the 1985-89 period. The SD GDP per capita growth was similar to Latin American region between 3 to 6 percent. The distribution was negatively skewed which indicates mostly the growth figures exceeded the average mean.

<b>ASIA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
INDIA	-0.2	1.4	3.2	3.7	2.7	4.7	4.3
S. KOREA	5.9	6.8	4.6	8.1	6.8	3.7	4.8
PHILIPPINES	2.5	3.3	-1.4	0.1	-0.5	1.5	2.7
INDONESIA	5.6	5.0	4.7	4.2	6.2	0.3	3.2
THAILAND	4.3	5.5	3.3	7.3	7.6	0.8	4.0
MALAYSIA	5.6	4.8	4.2	1.9	6.5	2.6	3.3
SINGAPORE	9.3	5.8	5.8	4.9	5.8	3.0	3.9
<b>Mean</b>	<b>4.7</b>	<b>4.6</b>	<b>3.5</b>	<b>4.3</b>	<b>5.0</b>	<b>2.4</b>	<b>3.7</b>
<b>Std Dev</b>	<b>3.6</b>	<b>1.8</b>	<b>2.3</b>	<b>2.8</b>	<b>2.9</b>	<b>1.6</b>	<b>0.7</b>
<b>SKEWNESS</b>	<b>0.1</b>	<b>-1.6</b>	<b>-1.7</b>	<b>-0.9</b>	<b>-1.0</b>	<b>-1.6</b>	<b>-1.0</b>

**(Table 3.5.2.3 – ASIA GDP Per Capita Growth)**

Growths in Asian economies were better than other regions. The average growth from 1970s until middle of 1995 was mostly above 4 percent, except in the 1980-84 period at only 3.5 percent. The worst of the Asian economy was during the latter half of 1990s when the average was at 2.5 percent due to the financial crisis that wreak havoc in 1997 and 1998. The difference in growth across Asian countries during any period was small indicated by SD that was lesser than 3 percent. Philippines growth rate was low from 1980 to 2000 due to political and economic turmoil. Malaysia growth rate was moderate from 1970 until 2000, except in the 1985-89 period and the 1995-99 period due to the economic recession.

### 3.5.3 Credit to Private Sectors

<b>LATIN AMERICA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
ARGENTINA	17.7	18.6	29.2	23.1	16.4	22.2	16.3
BRAZIL	40.5	52.9	44.5	91.7	75.9	38.7	30.3
MEXICO	32.2	23.7	16.2	13.1	27.4	23.7	17.2
CHILE	7.9	22.0	68.4	59.7	56.9	66.4	77.1
VENEZUELA	30.3	46.8	54.5	43.8	20.9	12.9	11.0
COLUMBIA	24.0	28.1	34.3	28.1	31.1	35.8	27.1
<b>Mean</b>	<b>25.4</b>	<b>32.0</b>	<b>41.2</b>	<b>43.3</b>	<b>38.1</b>	<b>33.3</b>	<b>29.8</b>
<b>Std Dev</b>	<b>11.2</b>	<b>14.3</b>	<b>18.7</b>	<b>28.9</b>	<b>26.2</b>	<b>17.8</b>	<b>22.6</b>
<b>SKEWNESS</b>	<b>-0.1</b>	<b>0.3</b>	<b>0.6</b>	<b>1.5</b>	<b>2.0</b>	<b>0.9</b>	<b>1.5</b>

**(Table 3.5.3.1 – LATIN AMERICA Credit to Private Sectors)**

Credit to private sector, as a proxy variable for financial development, in Latin American has a hump-shape trend from 1970s to 2004. It started with average 25 percent in the 1970-74 period and rose to 43 percent in the 1985-89 period before receding to 30 percent in the 2000-04 period. The increase in the 1980s was due to the government monetary policy of increasing the credit supply to compensate the escalating hyperinflation before they decided to tighten supply of credit in order to contain inflation. Brazil has the highest average of credit supplied during 1985-89 period, when it shot to 92 percent before decline to 40 percent by 1995-99 period.

<b>MENA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
S. Arabia	5.2	15.5	36.3	70.5	53.3	56.4	55.6
EGYPT	16.6	20.1	28.0	35.3	28.8	47.0	60.9
TURKEY	19.1	19.5	18.6	19.6	18.4	23.7	21.6
ISRAEL	34.2	54.7	70.8	56.9	61.1	70.4	87.3
MOROCCO	37.1	49.8	60.6	62.7	66.5	77.1	75.8
TUNISIA	44.1	54.5	63.7	69.1	67.5	68.6	72.9
SOUTH AFRICA	67.2	62.2	63.1	74.5	101.5	121.6	128.3
<b>Mean</b>	<b>31.9</b>	<b>39.5</b>	<b>48.7</b>	<b>55.5</b>	<b>56.7</b>	<b>66.4</b>	<b>71.8</b>
<b>Std Dev</b>	<b>19.5</b>	<b>19.9</b>	<b>20.6</b>	<b>19.7</b>	<b>25.5</b>	<b>28.8</b>	<b>30.9</b>
<b>SKEWNESS</b>	<b>0.5</b>	<b>-0.1</b>	<b>-0.4</b>	<b>-0.8</b>	<b>0.3</b>	<b>0.6</b>	<b>0.4</b>

**(Table 3.5.3.2 – MENA Credit to Private Sectors)**

MENA region experienced a steady average growth of credit to private sector as reflected in the increased of credit from 32 percent in the 1970-74 period to reaching 80 percent in the 2000-04 period. The rapid increase in the region reflected by the steep increased in South Africa, which nearly double its credit to private sector from merely 67 percent to 128 percent by 2000-04 period. Other countries that have similar rapid growth patterns are Israel, which nearly triple, while Morocco, Tunisia and Egypt have also doubled.

<b>ASIA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
INDIA	14.1	20.7	26.1	29.8	24.5	24.0	31.9
S. KOREA	41.7	40.1	53.1	57.0	62.0	72.9	97.6
PHILIPPINES	29.8	36.1	44.3	20.5	27.4	52.5	37.9
INDONESIA	NA	NA	13.2	26.3	48.4	48.7	22.2
THAILAND	21.5	37.1	47.5	62.2	102.0	148.1	99.1
MALAYSIA	26.3	43.3	78.5	119.3	114.7	191.8	163.6
SINGAPORE	57.3	68.7	94.9	99.1	97.5	114.6	114.7
<b>Mean</b>	<b>NA</b>	<b>NA</b>	<b>51.1</b>	<b>59.1</b>	<b>68.1</b>	<b>93.2</b>	<b>81.0</b>
<b>Std Dev</b>	<b>14.7</b>	<b>NA</b>	<b>28.3</b>	<b>38.0</b>	<b>36.9</b>	<b>60.6</b>	<b>52.1</b>
<b>SKEWNESS</b>	<b>0.8</b>	<b>0.7</b>	<b>0.4</b>	<b>0.6</b>	<b>0.5</b>	<b>0.6</b>	<b>0.4</b>

**(Table 3.5.3.3 – ASIA PACIFIC Credit to Private Sectors)**

Credit to private sector for Asian region remained at moderate level between 50 to 60 percent between 1980 until 1994 before it climbed to average 93 percent. The sudden increased in the region was due to the influx of foreign direct investment in the region and the loose monetary policy exercised by the government. In the following years, due to the financial recession in 1997-98, credit supply declined to average 80 percent. SD across the countries was high between 28 to 60 percent from 1985 to 2004. This was because countries such as Malaysia, Singapore, and Thailand has credit supplied between 60 to 120 percent, as oppose to countries such as India, Philippines and Indonesia with credit supplied between 20 to 48 percent. The distribution shows positive skewness indicating most of the credit figures are lesser than the average. Malaysia has one of the most expansionary monetary policy with credit supply above 100 percent from 1990 to 2004.

### 3.5.4 Inflation

<b>LATIN AMERICA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
ARGENTINA	38.3	227.6	268.1	863.3	505.1	0.8	8.3
BRAZIL	NA	NA	132.4	532.3	1667.2	19.3	8.7
MEXICO	10.3	19.1	56.1	82.0	16.3	24.5	6.0
CHILE	198.7	150.4	22.4	20.3	17.5	6.0	2.8
VENEZUELA	4.2	9.0	13.0	33.0	41.0	53.8	20.8
COLUMBIA	14.9	23.7	22.9	24.0	26.6	17.8	7.3
<b>Mean</b>	<b>NA</b>	<b>NA</b>	<b>85.8</b>	<b>259.1</b>	<b>379.0</b>	<b>20.4</b>	<b>9.0</b>
<b>Std Dev</b>	<b>117.8</b>	<b>118.1</b>	<b>127.5</b>	<b>607.1</b>	<b>807.3</b>	<b>23.0</b>	<b>7.8</b>
<b>SKEWNESS</b>	<b>3.3</b>	<b>1.9</b>	<b>3.2</b>	<b>4.0</b>	<b>2.2</b>	<b>1.9</b>	<b>1.3</b>

**(Table 3.5.4.1 – LATIN AMERICA Inflation)**

During the early 1970s, Chile and Argentina were experiencing hyperinflation, while other Latin American countries' inflation rates were at double digit. Columbia was experiencing high inflation between average 15 to 25 percent during the 1970-79 period. During the 1985-89 period, Argentina and Brazil experienced hyperinflation of more than 500 percent. Chile inflation declined during the 1980s due to strict monetary policy and while at the same period, the government decided to open up and liberalise the economy. During the 1985-89 and 1990-94 periods, Latin American region recorded average inflation rates of 260 and 379 percent, respectively. Later, inflation declined steeply the following years to an average of 9 percent in the 2000-04 period after Argentina and Brazil observed IMF strict monetary and fiscal policy as well as beginning to open up their economy.

<b>MENA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
S. Arabia	9.4	15.4	1.3	-1.2	1.7	0.9	-0.2
EGYPT	4.8	10.7	15.8	18.9	14.1	6.9	4.7
TURKEY	13.1	33.5	51.5	51.1	73.7	80.7	38.0
ISRAEL	18.1	47.2	177.5	81.8	14.3	8.2	1.6
MOROCCO	6.2	9.4	10.2	5.0	6.2	2.7	1.6
TUNISIA	NA	NA	8.9	7.3	5.9	3.9	2.8
SOUTH AFRICA	7.5	11.8	13.5	15.7	12.4	7.3	5.5
<b>Mean</b>	<b>NA</b>	<b>NA</b>	<b>43.8</b>	<b>25.5</b>	<b>18.3</b>	<b>15.8</b>	<b>7.7</b>
<b>Std Dev</b>	<b>8.2</b>	<b>18.4</b>	<b>74.7</b>	<b>51.8</b>	<b>24.4</b>	<b>27.3</b>	<b>14.5</b>
<b>SKEWNESS</b>	<b>1.8</b>	<b>1.5</b>	<b>3.2</b>	<b>4.9</b>	<b>2.3</b>	<b>2.1</b>	<b>2.7</b>

**(Table 3.5.4.2 – MENA Inflation)**

MENA recorded average inflation rate of 40 percent in the 1980-84 period. The high inflation rate in the region was attributed to Israel high inflation, which ran up to an average of 177 percent. The following years the average inflation gradually declined yet remained relatively high at double digit rate between 15 to 25 percent from 1985 to 1999. Inflation only declined to 8 percent by the 2000-04 period. SD between countries was high, especially in the 1980-89 period at an average of 75 percent. This was mainly due to very low inflation reaching negative figures in Saudi Arabia versus Israel inflation running between 80 to 177 percent during that period. The skewness was positive indicating that majority of the inflation figures were less than the average.

<b>ASIA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
INDIA	10.4	5.6	9.4	8.0	10.6	7.0	3.7
S. KOREA	13.7	16.7	12.6	4.2	7.0	4.4	3.2
PHILIPPINES	18.9	10.1	20.4	9.4	11.0	7.0	4.6
INDONESIA	19.0	14.9	12.4	6.9	8.6	20.5	8.0
THAILAND	9.0	7.0	8.4	3.2	4.8	5.1	1.7
MALAYSIA	6.9	4.1	6.0	1.3	3.8	3.5	1.5
SINGAPORE	9.3	2.6	4.9	0.7	2.9	1.0	0.8
<b>Mean</b>	<b>12.5</b>	<b>8.7</b>	<b>10.6</b>	<b>4.8</b>	<b>7.0</b>	<b>6.9</b>	<b>3.4</b>
<b>Std Dev</b>	<b>10.4</b>	<b>5.4</b>	<b>5.2</b>	<b>3.4</b>	<b>3.3</b>	<b>6.3</b>	<b>2.5</b>
<b>SKEWNESS</b>	<b>0.8</b>	<b>0.7</b>	<b>2.7</b>	<b>2.0</b>	<b>1.0</b>	<b>4.6</b>	<b>1.7</b>



**(Table 3.5.4.3 – ASIA PACIFIC Inflation)**

In contrast to the other two regions, the inflation rate in Asia is considered mild. Its highest inflation rate was at 12 percent in the 1970-74 period before declining to 10 percent in the 1985-89 period. It declined further to hit 3 percent in the 2000-04 period. One of the countries that experienced the highest inflation rate in that region is Indonesia with rates running between 10 to 20 percent from 1970 to 1984 period before declining to single digit. It surged back to an average of 20 percent during the 1995-99 period at the peak of financial crisis before declined again. SD for inflation across countries was between 2 to five percent which is considered low as compared to other two regions.

### 3.5.5 Real Deposit Interest Rate

<b>LATIN AMERICA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
ARGENTINA	NA	-48.9	-59.9	2838.4	-181.9	7.6	7.0
BRAZIL	NA	NA	39.2	969.8	2400.1	12.1	9.6
MEXICO	NA	-8.5	-15.5	-18.0	2.9	-2.6	-1.2
CHILE	NA	12.7	14.2	3.5	5.4	6.5	2.0
VENEZUELA	NA	NA	NA	-23.1	-5.6	-25.7	-0.9
COLUMBIA	NA	NA	NA	8.3	4.5	10.5	2.5
Mean	NA	NA	NA	629.8	370.9	1.4	3.2
Std Dev	NA	26.8	64.0	2723.5	1315.0	18.6	5.7
SKEWNESS	NA	-0.5	-2.4	4.8	3.9	-2.6	0.6

**(Table 3.5.5.1 – LATIN AMERICA Real Deposit Interest rate)**

Real deposit interest rate in countries in 1980s such as Argentina and Brazil was extremely high in order to mitigate the runaway inflation and currency devaluation they were experience during that period. On the other hand, Mexico and Venezuela was experiencing negative real deposit rate from 1980s until recently. However, the negative interest rate has improved from negative double digit registered during the early 1980s to minus single digit by 2000. Only Chile and Columbia has their real deposit interest rate relatively stable with less than 10 percent since 1980s.

<b>MENA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
S. Arabia	NA	NA	NA	NA	NA	NA	NA
EGYPT	NA	-5.9	-5.5	-7.8	-2.1	3.1	4.1
TURKEY	-10.6	-27.3	-16.2	-5.6	-7.5	-1.8	8.8
ISRAEL	NA	NA	25.9	-32.7	-1.8	4.6	4.6
MOROCCO	NA	-4.5	-4.2	3.4	1.1	5.1	2.8
TUNISIA	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SOUTH AFRICA	NA	-4.4	-4.2	-2.0	3.5	6.9	4.8
<b>Mean</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

**(Table 3.5.5.2 – MENA Real Deposit Interest rate)**

. The real deposit rates for most countries in the region such as Turkey and South Africa prior to 1990s were negatives. It is only after the 1990 decade that the rates transformed to positives. The negative rates were due to high inflation that exceeded the current nominal rates. Morocco, South Africa and Israel real interest rates peaked in the 1995-99 period, prior to the Asian financial crisis. However, Turkey has been experiencing negative rates since 1970s and only registered positive in the 2000-04 period.

<b>ASIA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
INDIA	NA	NA	NA	NA	NA	NA	NA
S. KOREA	2.7	-0.1	-0.4	5.8	2.4	5.2	2.1
PHILIPPINES	NA	-2.4	-5.5	3.4	3.5	2.7	2.0
INDONESIA	-2.8	-5.9	-4.4	10.4	8.9	3.3	4.1
THAILAND	NA	-0.9	3.3	7.8	5.7	5.2	1.1
MALAYSIA	-1.4	1.3	2.7	4.0	2.7	3.2	1.7
SINGAPORE	NA	1.0	3.2	2.9	0.6	2.4	0.2
<b>Mean</b>	<b>NA</b>	<b>-1.3</b>	<b>-0.2</b>	<b>5.7</b>	<b>4.0</b>	<b>3.7</b>	<b>1.9</b>
<b>Std Dev</b>	<b>12.1</b>	<b>4.3</b>	<b>8.1</b>	<b>4.0</b>	<b>3.5</b>	<b>5.2</b>	<b>2.1</b>
<b>SKEWNESS</b>	<b>-1.1</b>	<b>-1.1</b>	<b>-1.7</b>	<b>-0.1</b>	<b>1.3</b>	<b>-2.6</b>	<b>1.4</b>

**(Table 3.5.5.3 – ASIA PACIFIC Real Deposit Interest rate)**

The average real deposit interest rate in Asia, except India, shows minus 1.3 percent in the 1975-79 period. It turned positive in the 1985-89 period at 6 percent before gradually declined to 2 percent by

200-2004 period. SD was between 4 to 8 percent from 1975-79 to 1995-99 period which is rather modest compared to MENA and Latin American region.

### 3.5.6 Youth Dependency Population

<b>LATIN AMERICA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
ARGENTINA	29.1	29.5	30.4	30.6	29.7	28.3	27.1
BRAZIL	41.6	39.4	37.6	36.4	34.2	31.3	28.7
MEXICO	46.5	45.7	43.8	40.7	37.3	34.6	32.2
CHILE	38.7	35.3	32.0	30.4	29.8	29.0	26.6
VENEZUELA	44.8	42.2	39.9	38.6	37.3	35.1	32.7
COLUMBIA	45.0	42.5	39.7	37.5	35.9	34.0	32.0
<b>Mean</b>	<b>40.9</b>	<b>39.1</b>	<b>37.2</b>	<b>35.7</b>	<b>34.1</b>	<b>32.1</b>	<b>29.9</b>
<b>Std Dev</b>	<b>6.0</b>	<b>5.5</b>	<b>4.8</b>	<b>4.0</b>	<b>3.3</b>	<b>2.8</b>	<b>2.6</b>
<b>SKEWNESS</b>	<b>-1.2</b>	<b>-0.7</b>	<b>-0.2</b>	<b>-0.3</b>	<b>-0.4</b>	<b>-0.2</b>	<b>-0.1</b>

**(Table 3.5.6.1 – LATIN AMERICA Youth Dependency Population)**

The youth dependence population in Latin America on average, i.e. that age between 0 to 15 years, has decline steadily from 41 percent in 1970s to 28 percent by 2005. It has been declining by an average of 2 to 3 percent every 5 years since 1970. This also indicates in the long-term the population growth rate is fast declining.

<b>MENA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
S. Arabia	44.4	44.5	43.5	42.0	41.9	40.2	36.5
EGYPT	42.7	42.2	42.1	42.2	41.5	38.8	35.4
TURKEY	41.5	41.0	39.8	38.0	35.0	32.2	29.7
ISRAEL	32.9	33.0	33.0	32.1	30.4	28.8	28.1
MOROCCO	46.5	45.7	43.8	40.7	37.3	34.6	32.2
TUNISIA	45.3	43.0	41.3	39.4	36.7	32.6	28.2
SOUTH AFRICA	42.0	41.8	41.2	40.0	37.8	35.0	32.8
<b>Mean</b>	<b>42.2</b>	<b>41.6</b>	<b>40.7</b>	<b>39.2</b>	<b>37.2</b>	<b>34.6</b>	<b>31.8</b>
<b>Std Dev</b>	<b>4.2</b>	<b>3.9</b>	<b>3.4</b>	<b>3.3</b>	<b>3.8</b>	<b>3.8</b>	<b>3.2</b>
<b>SKEWNESS</b>	<b>-1.4</b>	<b>-1.4</b>	<b>-1.5</b>	<b>-1.3</b>	<b>-0.4</b>	<b>0.1</b>	<b>0.2</b>

**(Table 3.5.6.2 – MENA Youth Dependency Population)**

The youth dependence population trend for MENA region is similar to Latin American. It shows declining trend from 42 percent in the 1970-74 period to 32 percent in the 2000-2004 period. The decline reflected the same trend across all the countries in the region. The trend show lesser decline for the first 20 years of only 2 percent decline to reach average of 39 percent in the 1985-89 period. After 1990 it then declined by 3 percent every 5 years before reaching lows of 32 percent in the 2000-04 period. This rapidity of the decline reflected the same across all the countries as SD remain relatively the same at 3 to 4 percent from 1970 to 2004.

<b>ASIA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
INDIA	40.5	39.7	39.0	38.4	37.4	36.1	34.3
S. KOREA	40.7	36.4	32.4	28.2	24.5	22.1	20.2
PHILIPPINES	44.9	43.8	42.6	41.3	40.2	38.8	36.9
INDONESIA	42.2	41.3	39.7	37.4	34.7	31.9	29.5
THAILAND	43.7	41.5	37.5	32.5	28.8	26.4	24.2
MALAYSIA	43.7	40.9	39.0	38.2	37.0	35.1	32.6
SINGAPORE	36.4	30.4	25.9	23.0	21.7	22.2	21.1
<b>Mean</b>	<b>41.7</b>	<b>39.1</b>	<b>36.6</b>	<b>34.1</b>	<b>32.0</b>	<b>30.4</b>	<b>28.4</b>
<b>Std Dev</b>	2.8	4.5	5.6	6.6	7.1	6.8	6.6
<b>SKEWNESS</b>	-1.1	-1.3	-1.1	-0.7	-0.4	-0.2	-0.1

**(Table 3.5.6.3 – ASIA PACIFIC Youth Dependency Population)**

The youth dependency for the Asian region also decreased at a faster rate. It started at 41.7 percent in 1970 and ended up on average of 28 percent in the 2000-2004 period. However the SD is bigger than the rest of other regions, where it registered between 6 to 7 percent from 1980s onward. The reason was the youth dependency of Singapore in the same period was half compared to Philippines, i.e. Singapore was marginally above 20 percent whereas Philippines was more than 49 percent of the population.

### 3.5.7 Old Dependency Population

<b>LATIN AMERICA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
ARGENTINA	7.4	8.0	8.5	8.9	9.4	9.9	10.2
BRAZIL	3.7	4.0	4.1	4.2	4.6	5.2	5.8
MEXICO	3.7	3.8	3.9	4.1	4.5	5.0	5.4
CHILE	5.2	5.5	5.7	6.0	6.3	6.9	7.6
VENEZUELA	3.1	3.2	3.3	3.5	3.9	4.3	4.7
COLUMBIA	3.5	3.7	3.9	4.1	4.4	4.6	4.9
<b>Mean</b>	<b>4.4</b>	<b>4.7</b>	<b>4.9</b>	<b>5.2</b>	<b>5.5</b>	<b>6.0</b>	<b>6.4</b>
<b>Std Dev</b>	<b>1.5</b>	<b>1.7</b>	<b>1.8</b>	<b>1.9</b>	<b>1.9</b>	<b>2.0</b>	<b>2.0</b>
<b>SKEWNESS</b>	<b>1.2</b>	<b>1.3</b>	<b>1.3</b>	<b>1.3</b>	<b>1.3</b>	<b>1.3</b>	<b>1.1</b>

**(Table 3.5.7.1 – LATIN AMERICA Old Dependency Population)**

On the other hand, the old dependency population, i.e. those above 65 age, for Latin American region was showing steady increased from 4.5 percent in the 1970-74 period to 6.4 percent in the 2000-04 period. It is increased by 0.3 percent of total population every five years. SD remained the same throughout the years.

<b>MENA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
S. Arabia	3.1	2.9	2.6	2.4	2.3	2.5	2.8
EGYPT	3.4	3.5	3.5	3.6	3.8	4.1	4.4
TURKEY	4.3	4.5	4.4	4.1	4.2	4.8	5.4
ISRAEL	7.1	8.2	8.7	8.9	9.4	9.9	10.0
MOROCCO	4.0	3.8	4.1	3.9	4.0	4.5	4.9
TUNISIA	3.7	3.6	3.8	4.2	5.1	6.0	6.5
SOUTH AFRICA	3.3	3.2	3.1	3.1	3.2	3.5	3.8
<b>Mean</b>	<b>4.1</b>	<b>4.2</b>	<b>4.3</b>	<b>4.3</b>	<b>4.6</b>	<b>5.1</b>	<b>5.4</b>
<b>Std Dev</b>	<b>1.3</b>	<b>1.7</b>	<b>1.9</b>	<b>2.0</b>	<b>2.2</b>	<b>2.3</b>	<b>2.2</b>
<b>SKEWNESS</b>	<b>1.8</b>	<b>1.8</b>	<b>1.7</b>	<b>1.7</b>	<b>1.5</b>	<b>1.3</b>	<b>1.1</b>

**(Table 3.5.7.2 – MENA Old Dependency Population)**

For MENA region, the percentage remained stable between 4.1 to 4.3 percent in the 1970-74 period until 1985-89 period before it began to rise. From 1990-94 period, it rose by average 0.3 percent every five years until reaching five percent by 2000-04 period.

<b>ASIA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
INDIA	3.3	3.5	3.6	3.8	3.9	4.1	4.4
S. KOREA	3.4	3.6	4.0	4.6	5.3	6.4	8.1
PHILIPPINES	3.0	3.1	3.2	3.2	3.2	3.3	3.6
INDONESIA	3.2	3.3	3.5	3.6	4.0	4.5	5.1
THAILAND	3.5	3.7	4.0	4.3	4.9	5.8	6.7
MALAYSIA	3.6	3.7	3.7	3.7	3.7	3.8	4.1
SINGAPORE	3.7	4.4	5.0	5.4	5.8	6.6	7.7
<b>Mean</b>	<b>3.4</b>	<b>3.6</b>	<b>3.9</b>	<b>4.1</b>	<b>4.4</b>	<b>4.9</b>	<b>5.7</b>
<b>Std Dev</b>	<b>0.2</b>	<b>0.4</b>	<b>0.6</b>	<b>0.7</b>	<b>1.0</b>	<b>1.3</b>	<b>1.8</b>
<b>SKEWNESS</b>	<b>0.2</b>	<b>0.9</b>	<b>1.1</b>	<b>0.8</b>	<b>0.4</b>	<b>0.3</b>	<b>0.4</b>

**(Table 3.5.7.3 – ASIA PACIFIC Old Dependency Population)**

Asian region old dependency population also shows steady increased. In 1970-74 period, it stood on average of 3.4 percent and nearly double thirty years later to 5.7 percent in the 2000-04 period. On average it increased by 0.3 percent every five years from 1970-74 period until 1985-89 period. Then it increased steeply by 0.8 percent beginning in the 1990-94 period until the 2000-04 period.

### 3.5.8 Urban Growth

<b>LATIN AMERICA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
ARGENTINA	2.2	2.0	2.0	1.9	1.8	1.5	1.3
BRAZIL	4.4	4.2	3.5	3.0	2.4	2.3	2.1
MEXICO	4.4	3.9	3.1	2.7	2.4	1.9	1.5
CHILE	2.6	2.2	2.0	1.9	2.0	1.8	1.5
VENEZUELA	4.5	4.4	3.7	3.1	2.8	2.7	2.4
COLUMBIA	3.3	3.2	3.2	2.8	2.6	2.3	2.0
<b>Mean</b>	<b>3.6</b>	<b>3.3</b>	<b>2.9</b>	<b>2.6</b>	<b>2.3</b>	<b>2.1</b>	<b>1.8</b>
<b>Std Dev</b>	<b>1.0</b>	<b>1.0</b>	<b>0.7</b>	<b>0.5</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>
<b>SKEWNESS</b>	<b>-0.3</b>	<b>-0.3</b>	<b>-0.3</b>	<b>-0.4</b>	<b>-0.3</b>	<b>0.0</b>	<b>0.2</b>

**(Table 3.5.8.1 – LATIN AMERICA Urban Growth)**

Initially, there is a considerable migration to urban areas in the 1970's with average urban migration between 3.3 to 3.6 percent growths every year. It gradually declined to 1.6 to 1.8 percent by the 2000-04 period. Similar declining trend reflects across most Latin American countries. Overall, the standard deviation is less than one percent across the countries, which reflects less variation in growth. However, there are two countries, which urban rates were lesser than the rest, i.e. Argentina and Chile. Both countries urban rates have been slightly over 2 percent in the 1970-74 period before declined marginally to 1.5 percent in the 2000-04 period.

<b>MENA</b>	<b>1970-74</b>	<b>1975-79</b>	<b>1980-84</b>	<b>1985-89</b>	<b>1990-94</b>	<b>1995-99</b>	<b>2000-2004</b>
S. Arabia	8.2	8.1	8.0	6.4	3.3	2.6	2.5
EGYPT	2.8	2.5	2.6	2.5	1.8	1.7	1.9
TURKEY	4.4	3.5	5.3	4.5	3.0	2.5	2.2
ISRAEL	3.8	2.8	2.2	1.8	3.7	2.6	2.2
MOROCCO	4.4	4.3	4.1	3.7	3.2	2.3	1.8
TUNISIA	3.6	3.8	3.7	3.9	3.3	2.1	1.6
SOUTH AFRICA	2.4	2.3	2.8	3.4	3.0	3.2	2.4
<b>Mean</b>	<b>4.2</b>	<b>3.9</b>	<b>4.1</b>	<b>3.7</b>	<b>3.0</b>	<b>2.4</b>	<b>2.1</b>
<b>Std Dev</b>	<b>1.8</b>	<b>1.9</b>	<b>1.9</b>	<b>1.4</b>	<b>0.9</b>	<b>0.5</b>	<b>0.4</b>
<b>SKEWNESS</b>	<b>1.4</b>	<b>1.6</b>	<b>1.1</b>	<b>0.8</b>	<b>1.2</b>	<b>0.0</b>	<b>0.8</b>

**(Table 3.5.8.2 – MENA Urban Growth)**

Similarly, MENA region recorded high urban rate in the 1970-74 period with an average of 4.2 percent in the 1970-74 period. It declined to 2 percent by 2000-04 period. Saudi Arabia recorded the highest migration rate of 8 percent rate from 1970 until mid 1980s as they developed new townships for new residents. By the middle of 1980's, there was declined in migration as lesser new township being built due to economic slowdown from the decline in oil price. By 2000-04 period, the average urban rate grew to 2.1 percent only.

Likewise, individual MENA countries growth rates remained close to the average regional rate with declining growth trend, except in South Africa, Egypt and Israel. South Africa growth trend reflects a mild hump-shape with lower rates at 2.4 percent during the 1970-74 period and began to increase to 3.4 percent in the 1980-84 period before declined to 2 percent in the 2000-04 period. Meanwhile, Israel urban growth fluctuated between 2 to 4 percent growth due to never-ending regional conflict with its Middle East neighbours to building new settlements for their population. On the other end, Egypt growth rate remained relatively constant around 2 percent for the past thirty years.

<b>ASIA</b>	<b>1970-74</b>	<b>1975-79</b>	<b>1980-84</b>	<b>1985-89</b>	<b>1990-94</b>	<b>1995-99</b>	<b>2000-2004</b>
INDIA	3.7	3.9	3.3	3.1	2.8	2.6	2.3
S. KOREA	5.6	5.0	4.3	3.5	2.4	1.5	0.9
PHILIPPINES	4.2	3.8	5.1	5.1	4.4	3.8	3.4
INDONESIA	4.7	5.0	5.2	5.0	4.7	4.6	4.1
THAILAND	4.9	4.7	3.4	2.5	1.9	1.3	1.8
MALAYSIA	4.8	4.5	4.4	4.5	4.8	4.7	3.8
SINGAPORE	1.8	1.3	2.7	1.4	3.1	2.9	1.0
<b>Mean</b>	<b>4.2</b>	<b>4.0</b>	<b>4.1</b>	<b>3.6</b>	<b>3.4</b>	<b>3.0</b>	<b>2.5</b>
<b>Std Dev</b>	<b>1.2</b>	<b>1.3</b>	<b>0.9</b>	<b>1.4</b>	<b>1.2</b>	<b>1.4</b>	<b>1.3</b>
<b>SKEWNESS</b>	<b>-0.9</b>	<b>-1.5</b>	<b>-0.8</b>	<b>-0.9</b>	<b>0.0</b>	<b>-0.2</b>	<b>-0.6</b>

**(Table 3.5.8.3– ASIA PACIFIC Urban Growth)**

Urban growth in Asia on the average declined slower than the rest of the region. It started on average of 4 percent during the 1970-74 period before declined to 2.1 percent by the 2000-04 period. Its standard deviation across the countries on average is marginally over one percent from 1970 to 2000. The only figure that remained odd is Singapore as it not only an independent nation but also a major city in its entirety. There is no other location within Singapore that can be classified as rural. Therefore, its urban migration growth rate is in fact its country's population growth rate. The rates fluctuated considerably as the rate was a result of international migration, i.e. expatriates who seek work into the country.



India with the second highest world population shows the same declining trend as the region's average rate. Its average growth rate was between 3 to 4 percent from the 1970 until 1984 before declining to 2.3 percent by the 2000-04 period. South Korea reflects dramatic decline as its migration rate was around five percent in the 1970-74 period before ending at one percent in the 2000-04 period. The dramatic steep decline was during the 1990s onwards as President Park introduced rural revitalizing programmes to discourage urban migration, especially young people from migrating into the cities.

### 3.6 WITHIN REGION COMPARISON: SAVINGS AND OTHER DETERMINANTS

After determining the average of each variable, these averages are then pooled together within each region as shown in each table below. The reason pooling all the average variables together within the individual region is to observe in more detail their trends and trajectories for the past thirty years between 1970 until 2004.

#### 3.6.1 Latin American Region

<b>LATIN AMERICA</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
PRIVATE SAVINGS	21.2	21.0	19.6	18.7	16.9	16.7	18.6
GDP Per Capita	3.1	2.1	-1.0	1.0	2.8	0.9	1.2
Credit to Private Sec	25.4	32.0	41.2	43.3	38.1	33.3	29.8
Inflation	NA	NA	85.8	259.1	379.0	20.4	9.0
Real Deposit Rate	NA	NA	NA	629.8	370.9	1.4	3.2
Youth Dependency	40.9	39.1	37.2	35.7	34.1	32.1	29.9
Old Dependency	4.4	4.7	4.9	5.2	5.5	6.0	6.4
Urban Growth	3.6	3.3	2.9	2.6	2.3	2.1	1.8

Private savings and youth dependency in Latin America show declining trend from 1970 to 2004; in contrast, old dependency ratio shows increasing trend. GDP per capita growth rates do not show any observable correlations to saving as it reflects mild U-shaped trend. Credit to private sectors and inflation show a mild hump-shaped trend, which reflects both are closely correlated.

We can conclude from our observation regarding Latin American region that youth dependency with its declining trend has positive correlations with private savings, while old dependency with its increasing trend reflects negative correlation with savings. GDP per capita growth, inflation, real deposit interest rates did not bear any significant correlations with private savings in Latin America.

### 3.6.2 MENA Region

<b>MENA REGION</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
PRIVATE SAVINGS	21.4	17.3	14.7	12.3	13.8	13.5	14.6
GDP Per Capita	4.9	2.6	0.4	0.6	1.5	1.7	2.3
Credit to Private Sector	31.9	39.5	48.7	55.5	56.7	66.4	71.8
Inflation	NA	NA	43.8	25.5	18.3	15.8	7.7
Real Deposit Rate	NA	NA	NA	NA	NA	NA	NA
Youth Dependency	42.2	41.6	40.7	39.2	37.2	34.6	31.8
Old Dependency	4.1	4.2	4.3	4.3	4.6	5.1	5.4
Urban Growth	4.2	3.9	4.1	3.7	3.0	2.4	2.1

Private savings, inflation and youth dependency in MENA region shows similar declining trend from 1970. It can be inferred that private savings is positively correlated with inflation and youth dependency. It corroborate with previous researches regarding inflation, in which inflation is a proxy to uncertainties. The more uncertain is economy, the higher will be aggregate savings, and vice versa.

In contrast, credit to private sectors and old dependency variables show an increasing trend. It can be inferred that increased in financial development is associated with lesser savings. The individuals do not have to save more in order to buy big ticket items, such as houses, cars and other lumpy goods as they are able to access loans from banks to purchase them.

With respect to the relationship between youth and old dependency, both variables should indicate inverse correlation with savings as postulated by LCH. Only youth dependency shows declining trend, which indicates positive correlation with savings. GDP per capita income shows declining trend from the

1970-74 period and recovering in later years, which also show similar trend to savings. It indicates that there is a positive correlation between both variables.

### 3.6.3 Asia Pacific Region

<b>ASIA REGION</b>	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2004
PRIVATE SAVINGS	21.2	25.3	26.0	27.7	28.4	29.6	28.5
GDP Per Capita	4.7	4.6	3.5	4.3	5.0	2.4	3.7
Credit to Private Sector	NA	NA	51.1	59.1	68.1	93.2	81.0
Inflation	12.5	8.7	10.6	4.8	7.0	6.9	3.4
Real Deposit Rate	NA	-1.3	-0.2	5.7	4.0	3.7	1.9
Youth Dependency	41.7	39.1	36.6	34.1	32.0	30.4	28.4
Old Dependency	3.4	3.6	3.9	4.1	4.4	4.9	5.7
Urban Growth	4.2	4.0	4.1	3.6	3.4	3.0	2.5

Private savings in Asian region indicate steady long-term growth trend. Similarly, variables such as credit to private sectors, and old dependency show increasing trend, while youth dependency similar to previous regions shows declining trend.

The trend in Asia Pacific region indicates that financial development and old dependency have positive correlations with savings. In that sense, the financial deepening is associated with more people to invest into bank deposit, therefore increase savings. Similarly, it can be concluded that the increase number of retirees or old dependency population helps to increase savings. This meant that more retirees even though their income diminish, their expenses also decreased, but at greater rate than income. Hence, they would leave with surplus funds, which they would channel into savings.

Youth dependency shows a negative correlation with savings, which corresponds with LCH. Increased in savings is associated with lesser proportion of youth dependency population throughout the years.

Inflation, GDP per income growth and real deposit interest rate do not show any obvious trend to link with savings. Therefore, we can conclude that Asian GDP per capita growth, inflation and real deposit interest rate do not have any significant correlations with private savings.

### **3.7 CONCLUSION**

Based on the stylised facts, we have noted that most regions have experienced a decline in savings except the Asian Pacific region. Latin America experienced steady decline from average of 21 percent to 18 percent from the 1970-74 period to the 2000-2004 period, respectively. MENA region also depicts similar declining trend from 21 percent in the 1970-74 period to 15 percent in the 2000-2004 period. However, Asia Pacific regions (excluding China) have experienced a steady increase in savings from 21 percent in the 1970-74 period to 29 percent in the 2000-04 period.

The gap in savings rate within the region is lesser in Latin America region than other regions as depicted in Table 3.6.1.1 with standard deviation of less than 10 percent over the thirty years. Among the top most consistent savers is Venezuela with average savings more than 20 percent. The lowest saver in the region is Columbia with average savings around 10 percent per year over the thirty years.

Asia Pacific countries show the largest gap within the region with standard deviations of more than 10 percent (refer to Table 3.6.1.3). It is typified with low savers countries such as India with average savings of 10 percent compared to Singapore with average savings close to 50 percent. In MENA countries, the low savers are typified by Egypt with savings that is close to zero compared to high savers, i.e. Saudi Arabia with saving that reached more than 60 percent during the early 1970s but later declined as income from oil declined (refer to Table 3.6.1.2).

The third stylized fact is that there is correlation among savings and income growth. From the average trend of the regions, Latin America and MENA shows the GDP per capita growth are also in the same declining trend as savings, which indicate significant positive correlation between both variables. (Refer to Section 3.7.1 and 3.7.2). However, Asia Pacific region shows no significant correlation as saving in Asia was showing increasing trend, compared to per capita income growth showing levelled growth between 3 to five percent for more than thirty years.

## **CHAPTER 4**

### **PRIVATE SAVINGS AND DETERMINANTS**

#### **4.1 INTRODUCTION**

Although there are several theories that can be used to explain changes to savings, in this chapter we are using life cycle model (LCH) as an empirical framework for analysis across countries. The origin of Life Cycle Hypothesis (LCH) can be traced back to the study of Modigliani and Brumberg (1954).

The crux of the theory is based on the premise that the motivation for savings is driven by retirement. An individual would maximize his consumption and savings based on present value of utility, which is constrained by one's limited budget. The limited budget is the summation of the current asset plus the present value of the lifetime income. It is therefore assumed that one's level of consumption is not based on the present income but depended on the expected future income. Households will save during the period of high income relative to the low consumption, and will support higher consumption via dissaving during periods of relatively low earnings.

Further research modified this theory by introducing an early life-cycle stage of dependency, which would adversely affect savings. As such, based on demographic studies (Leff, 1969; Tobin, 1967), human life cycle can be divided into three stages, i.e. young dependency, productive working life and retirement age. The theory postulates that during young dependency and retirement age, consumption will exceed savings and savings mostly occurred during the productive working life.

One of the pioneers to use the LCH model in empirical testing is Tobin (1967). He included per capita income, rates of interest and wealth in his model for testing the LCH theory on 1960's US data. Subsequently, many other researchers have tested the theory by including macroeconomic and financial factors, as well as employing other econometric methodologies to analyse the effect of savings at the national or cross country level.

Drawing upon established research, this study seeks to examine and extend the LCH theory by focusing on emerging market economies and incorporating the importance of institutional factors. The LCH theory has proven its resilience in empirical testing with regard to the inclusion of other determinants in order to analyse the effect on savings, regardless of the period of investigation or geographic location. In extending this research, this chapter concentrates on using the traditional determinants of savings in testing the LCH model for specific emerging economies. Later, in Chapter 6, we test the LCH model by including institutional factors.

There are 20 developing countries that are being sampled and they encompass various regions, Asia Pacific (Indonesia, India, Malaysia, Philippines, Republic of Korea, Singapore, and Thailand), Latin America (Argentina, Brazil, Columbia, Chile, Mexico, and Venezuela), Middle East and Africa (Egypt, Israel, South Africa, Turkey, Morocco, Tunisia and Saudi Arabia).

## **4.2 METHODOLOGY AND DATA DESCRIPTION**

### **4.2.1 Methodology**

The methodology that will be used is the common panel least square method or Seemingly Unrelated Regression (SUR) as proposed by Zellner (1962). It assumes that the average values of the variable are constant and across the entire sectional unit in the sample. The intercepts are assumed to be the same for

each variable and for each period. We also assume that the error terms among cross sections to be contemporaneously correlated as recommended by Zellner (1962). The idea behind the pooling method is to transform the model so that the error terms across the cross section are uncorrelated. So, if the correlation between the error terms in the individual equation had been set to zero in the first place, the common panel least squares method is equivalent to running separate OLS on each equation. In addition, the correlations between error terms in different time periods are assumed to be zero.

Arnold Zellner (1962) introduced SUR or Seemingly Unrelated Regression equation model. It is essentially a Generalised Least Squares (GLS) method applied to several equations, each with its own dependent variable. Even though the error terms can be highly correlated across the equations, Zellner realised that the estimation can be made efficient by combining them together into larger matrices, assuming that the exogenous variables in the different equations are not correlated. Binkley and Nelson (1988) assert that when correlation across equations exists, the combined estimation provides considerable efficiency when there is multicollinearity within the equation. Zellner (1962) used data based on firm based investment collected yearly for 20 years. He shows that ordinary least squares (OLS) can be estimated in each individual equation, however, it is not as efficient as using feasible generalised least squares (FGLS) with its unique variance-covariance matrix form, which would be illustrated later.

SUR model resolves problems regarding the suitability of parameter variation across two dimension matrix and appropriate stochastic specification by establishing a system of N equations containing T observations. For example, assume there is a set of N cross sections with T time series observations on each equation, i.e.

$$y_{it} = \hat{x}_{it}\beta_i + \varepsilon_{it} \quad i = 1, \dots, m \quad \textbf{Equation 4.1}$$



Here  $i$  represents the equation number, and  $t = 1, \dots, T$  is the observation index. The number of observations is assumed to be large, so that  $T \rightarrow \infty$ , whereas the number of equations  $m$  remains fixed. Each equation  $i$  has a single response variable  $y_{it}$ , and a  $k_i$ -dimensional vector of regressors  $x_{it}$ . If we stack observations corresponding to the  $i$ -th equation into  $T$ -dimensional vectors and matrices, then the model can be written in vector form as,

$$y_i = X_i \beta_i + u_i \quad i=1,2,\dots,N \quad \textbf{Equation 4.2}$$

where  $y_i$  and  $u_i$  are  $T$ -dimensional vectors,  $X_i$  is  $T \times K_i$  and  $\beta_i$  is a  $K_i$ -dimensional vector.

Stacking all  $N$  equations yields:

$$\begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix} = \begin{bmatrix} X_1 & 0 & \dots & 0 \\ 0 & X_2 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & X_n \end{bmatrix} \begin{bmatrix} \beta_1 \\ \beta_2 \\ \vdots \\ \beta_n \end{bmatrix} + \begin{bmatrix} u_1 \\ u_2 \\ \vdots \\ u_n \end{bmatrix}$$

This can be written compactly as:

$$y = X\beta + \mu$$

The assumptions for vector of stacked disturbances are that  $E(\mu) = 0$  and the  $NT \times NT$  covariance matrix is comprised of  $N^2$  blocks of the form  $E(u^i u'^j) = \sigma_{ij} I_T$  where  $I_T$  is a  $T \times T$  identity matrix. It is assumed that the  $T$  disturbances in each of the  $N$  equations have zero mean, equal variance, uncorrelated and that covariances between contemporaneous disturbances for a pair of equations are nonzero but equal. Non-contemporaneous covariances are all zeroes. The full covariance matrix of  $u$  is given by  $\Omega = \Sigma \otimes I_T$  where  $\Sigma = [\sigma_{ij}]$  is the  $N \times N$  contemporaneous covariance matrix and  $\otimes$  denotes the Kronecker product.

Each of the  $N$  equations is individually assumed to satisfy the classical assumptions. The individual equations are related, even though superficially they may not seem to be; they are only seemingly unrelated. The GLS (generalized least squares) estimator is readily defined as:

$$\hat{\beta}(\Sigma) = (X(\hat{\Sigma} \otimes I_T)^{-1})X^{-1})X(\hat{\Sigma} \otimes I_T)^{-1}y,$$

With a covariance matrix given by

$$var[\hat{\beta}(\Sigma) = (X(\Sigma^{-1} \otimes I_T)^{-1})X^{-1}]$$

GLS estimator is known to reduce OLS when there is an absence of contemporaneous correlations ( $\sigma_{ij} = 0, i \neq j$ ); or the same set of explanatory variables is included in each equation ( $X_1 = X_2 = \dots = X_N$ ). There are many variants of this particular FGLS estimator. Obviously, OLS belongs to the class with  $\hat{\Sigma} = I_N$ , but Zellner (1962) proposed the first operational estimator that explicitly utilised the SUR structure. He suggested an estimated covariance matrix calculated from OLS residuals obtained from

$X_i\beta_i + u_i \quad i=1,2,\dots,N$ , namely  $S = (s_{ij})$  where  $s_{ij} = (y_i - X_i b_i)'(y_j - X_j b_j)/\tau$  and  $b_i$  is the OLS estimator of  $\beta_i$ .  $S$  has been referred to as the restricted estimator of  $\Sigma$ , but estimation can also be based on the unrestricted residuals derived from OLS regressions which include all explanatory variables from the SUR system

Eviews provides ways to estimate pooled specifications that include AR terms. Eviews allow the residuals to follow a general AR process:

$$\varepsilon_{it} = \sum_{r=1}^p p_{ri} \varepsilon_{it-r} + \eta_{it}$$

for all, where the innovations are independent and identically distributed, assuming further that there is no unit root. Autocorrelation coefficients are allowed to be cross-section.

$$Y_{jt} = X_{jt} b_j + \left[ \sum_{r=1}^{p_j} p_{jr} (Y_{j(t-r)} - X_{j(t-r)}) \right] + \epsilon_{jt} \quad \text{Equation 4.3}$$

It is assumed to be serially independent, but possibly correlated contemporaneously across equations. At the beginning of the first iteration, Eviews estimated the equation by nonlinear least squares and uses the estimates to compute the residuals. It then constructs an estimate of  $\Sigma$  using  $s_{ij} = (\hat{\epsilon}_i' \hat{\epsilon}_j / \max_i(T_i T_j))$  and perform nonlinear GLS to complete one iteration of the estimation procedure. These iterations may be repeated until the coefficients and weights converge.

The following is the empirical specification for the private savings behaviour:

$$\begin{aligned} PRVSAV = & \alpha + \beta_1 YTH\_DEP_{it} + \beta_2 OLD\_DEP_{it} + \beta_3 GDPcap\_GTH_{it} + \beta_4 GDPCAP_{it} + \beta_5 CRD\_PRV_{it} + \\ & \beta_6 LRDEP\_INT_{it} + \beta_7 L\_INFLAT_{it} + \beta_8 GOV\_SHR_{it} + \beta_9 OPEN_{it} + \beta_{10} Ubn\_ght_{it} + \beta_{11} ToT_{it} + \\ & \beta_{12} REMIT_{it} \end{aligned} \quad \text{Equation 4.4}$$

i stand for the country, PRVSAV is the private savings at time t, YTH\_DEP<sub>t</sub> is the young dependency at time t, OLD\_DEP<sub>t</sub> is the dependency ratio at time t, Ubn\_gh<sub>t</sub> is for share of urban population, GDPcap\_GTH<sub>t</sub> is the per capita GDP growth at time t, GDPCAP is the initial per capita income at time t, CRD\_PRV<sub>t</sub> is the domestic credit to private sector at time t, RDEP\_INT<sub>t</sub> is for log of the real deposit interest rate at time t, L\_INFLAT is the log of inflation rate at t, GOV\_SHR<sub>t</sub> is the government share of consumption over GDP at time t, OPEN is for trading openness at time t and TOT is for Terms of Trade at time t. The justification for incorporating these specific variables in the model is discussed below along with a discussion of the issues relating to their measurement.

#### 4.2.2 Data Description

Private saving variable is extracted from Penn State database 6.1, where it is synonymously associated with current savings expressed as a percent of Real Gross Domestic Product (RGDP). According to Penn World definition, current savings is taken after deducting government share (CG) and consumption share (CC) of Real Gross Domestic Product (CGDP) from 100 percent. The 100 percent represents the overall Real Gross Domestic Product. Hence, private savings or current savings includes the domestic savings held by the household and the private sectors only and excluding government savings. All the figures are in real terms, instead of nominal. Meanwhile, Beck et al (2000) uses private savings based on gross national disposable income minus consumption expenditures, and gross public savings, based on current price. In consideration to the data availability for the years and countries to be examined, Penn World current savings is the closest proxy for private savings.

Credit to private sectors over GDP (Crd\_Priv) variable is used extensively by numerous studies to proxy for financial development, and to reflect the growth of financial intermediaries in a country (Beck et al, 2000, Levine and Zervos' 1998, and Levine, 1998). It is measured as credits supplied by financial intermediary to the private sector divided by gross domestic product (GDP). Mainly it is used to measure the extent to which financial intermediaries are used by the private sectors as a source of funding. According to Beck et al (2000), this measure includes credit issued by deposit money banks and other financial intermediaries, but excludes credit to the public sector. It also measures the amount of savings that is channelled through debt-issuing financial intermediaries to private borrowers (Beck, 2003). Indirectly, it also depicts the way how the government conducts its monetary policy. The increase in the credit supply to private sector or money supply is an indicator of a loose monetary policy by the government either to resuscitate the economy or to sustain the current growth of the country. Vice-versa, the decrease in the credit supply to private sector is indicative of strict monetary policy pursued by the

government monetary agency to curb the rise in inflation from overheating the economy. Basically, the variable is chosen it is the closest substitute to reflect financial development of a country. Financial development is expected to improve aggregate savings and investments as it reduces information asymmetry, lessens transaction cost, improves corporate governance and assists in risk management (Rajan and Zingales, 1998 and Wurgler, 2000). The data is obtained from WDI.

Real per capita income growth (GDPcap\_GTH) is used as a measure for the average individual income growth or the increase in the standard of living and the source is from World Development Indicators. It is expected that real income growth would have significant outcome on savings as new cohorts or generations would have greater income than the previous generation, hence would contribute towards increased aggregate savings. Another measure is the initial level of GDP per capita income at constant 2000 price (GDP\_Cons) and it is in log form. Based on Solow growth theory, it is expected that newly developed countries with lower averaged income base would experience greater growth than developed countries due to growth convergence before all the countries reached steady state level. We would also attempt to find whether the same convergence phenomena occurred in savings for the countries since savings is considered as the endogenous variable.

Inflation rate in the log form is used as a proxy to a precautionary measure in lieu of the level of the uncertainties of the economy (Dornbusch and Fischer, 1993). It is measured a change in Consumer Price Index (CPI). Real deposit interest rate is derived from nominal deposit interest rate minus the inflation rate and is also being transformed into natural log. Since real rate is hardly available across for most emerging economies, therefore, we decided to use the real deposit rate as it is the closest to the real figure.

The demographic variable can be represented by two variables that are the young dependency period (YTH\_DEP) and old dependency (OLD\_DEP). Young dependency refers to the segment of individuals

who are between 0 to 14 years old, where an old dependency refers to the population over 65 years. Between these two periods, i.e. 14 until 65 years old, is the productive working age and the individual is expected to earn enough income to support their young dependents as well as preparing for old age. The young and old dependent population are expected to spend more, which will result dissavings. Increase in both non-working age population are expected to have negative effect on private savings.

Another important determinant of private savings is government savings. Masson (1988) derives the government savings from tax revenues less transfer payments and government consumption. Due to the inconsistency and unavailability of the data in most countries, we decided to use government consumption or expenditure over GDP (Gov\_Shr) as reverse proxy to the government savings. The data for government consumption derived from WDI, in which it includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditure on national defence and security, but excludes government military expenditures that are part of government capital formation.

Based on Ricardian Equivalence (RE), government savings have a crowding out effect on private savings, or in another word, government savings have negative effect on private savings. Under the assumption of Ricardian Equivalence, it is expected the greater is current government consumption, the lesser will be the government savings, but the greater will be private savings due to the precautionary measures taken. In conclusion, increase in government spending would have contemporaneous positive effect on private savings.

The growth of urban population (Urb\_Gth) is considered being a major factor affecting private savings rate. According to Laoyza et al (2000), the increase in urban population tends to lower the overall aggregate savings as rural population in general tends to save more as precautionary motive since their

aggregate income is subjected to seasonality. Urban growth variable is used as a measure of the increase of the country's population that have migrated from rural to urban area.

Openness or trade openness is to measure the degree of trading between the host countries with the outside world. It measures the extent of trade liberalisation adopted by the country and the degree of integration into the global trading community. Trade openness is expressed in terms of export plus import as a percentage of GDP. It is expected to have positive impact on saving via increase in per capita income growth.

Terms of trade according to World Bank Database is defined as the capacity to import less export of goods and services in constant prices. The population would expected to save more for precautionary purposes if the terms of trade is volatile and reflects unfavourably to the current balance of payment account. The terms of trade variable is expressed in terms of percentage of GDP. The source is from WDI.

Remit or workers's remittances represent current transfers by migrant workers and wages and salaries earned by non-resident workers. The data are reported by countries in their balance of payments (BoP). The numbers can be significant as few of the emerging economies, such as India and Egypt have sizable workers who work overseas and remit certain percentage of their salaries back home. With the increase of migration inflows, remittance source has become a source of capital inflows and income in many emerging economies. This would also be reflected in the money saved into the financial institutions.

### **4.3 CORRELATION**

Table 4.1 identifies that there is significant and high negative correlation between private savings and youth dependency (51 percent). This is consistent with LCH theory which indicates there should be an

**Table 4.1 CORRELATION MATRIX OF VARIABLES**

Variable	S_GDP	PCAP_GTH	GDP_CAP	LD_DEP	YTH_DEP	CRD_PRV	LG_RDEP	GOV_SHR	LG_INF	UBN_GTH	OPEN	REMIT	TOT
S_GDP	1												
GDP_CAP	0.33***	1											
LD_DEP	0.36***	-0.09*	1										
YTH_DEP	0.26***	-0.04	0.59	1									
CRD_PRV	-0.51***	-0.12***	-0.48***	-0.74***	1								
LG_RDEP	0.38***	0.02	0.2***	0	-0.22	1							
GOV_SHR	-0.13**	-0.22***	0.01	0.04	-0.05	-0.01	1						
LG_INF	-0.2***	-0.19***	0.49***	0.15***	0.04	0.14***	-0.02	1					
UBN_GTH	-0.21***	-0.21***	-0.04	-0.01	0.1*	-0.22***	0.53***	-0.17***	1				
OPEN	0.09*	-0.02	0.59***	0.38***	-0.37***	-0.17***	0.18***	0.36***	0.21***	1			
REMIT	0.39***	0.11**	-0.01	-0.09	-0.02	0.62***	-0.32***	0.02	-0.44***	-0.34***	1		
TOT	-0.41***	-0.05**	-0.43***	-0.21***	0.25***	-0.12**	-0.25***	-0.05	-0.13**	-0.32***	0.14***	1	
	0.18***	0	0.25***	0.02	-0.12**	-0.05	-0.06	0.08	0.02	0.22***	-0.07	0.09*	1

\*\*\*significant at 1 % level

\*\* significant at 5% level

\* significant at 10% level



inverse relationship between youth dependency and private savings. Per capita income has a high significant positive correlation with urban growth, at 59 percent, this indicates high level of population migrate to urban area and is associated with increase in per capita income.

The variables with lower correlation rates with private savings, but yet have significant association at five percent level, are: credit to private sectors, per capita income, old dependency, real deposit rate and inflation. Only credit to private sector and per capita income level show positive correlations with private savings, which indicates that the increased in both variables are associated with the increased in private savings. In contrast, inflation, real deposit rate, remittance and government share of expenditure show negative correlations with private savings. The negative correlations signifies an inverse relationship that is higher, the lower is the savings rate.

Other variables that have high significant correlations are credit to private sector with the openness variable. This indicates that the increased in money supply and financial deepening are correlated with the increased in the level of trade openness in these countries. However, there is negative correlation between youth and old dependency, signifying that the greater is the increase in the population of the young generation, the smaller is the percentage of the retirees, or old dependants.

Another pair of variables that shows significant correlation is real deposit rate and inflation. In contrast, the inflation and openness ratio show negative correlation at one percent significance. This indicates that the greater is the trade openness, the lower is the inflation, which can be attributed to deflationary effect from imported goods that deflate the average prices of goods and service of the host countries.

## 4.4 EMPIRICAL

### 4.4.1 Main Findings

Each control variable is added into the right hand side (RHS) side of equation in order to observe the impact of additional exogenous variable on private savings. In this standard pooling technique we assume all the intercepts are the same. This pooled technique or Seemingly Unrelated Regression (SUR) estimation was applied to minimize the cross-section heteroskedasticity and contemporaneous correlation (Zellner, 1962).

Based on [Table 4.2](#), a one percent increase in GDP capita growth will result in significant increase of 0.4 percent in private savings, *ceteris paribus*.

A one unit increase in log GDP per capita income will result an increase of 6.7 percent increase in private savings. The results corresponds with previous studies (Masson ,1998; Schrooten and Stephen, 2005) indicating positive relationship between growth and savings.

The demographic variables indicates that one percent increase in youth and old dependency population results in a significantly decreased private savings ratio of 0.95 percent and 3 percent, respectively. The F-test by normalizing the entire coefficient to zero rejects the null hypothesis that none of these variables have a significant effect on private savings. The F-test indicates that at least one of these variables has a significant effect on private savings. The Jarque-Bera normality test indicates that the p-value is less than 1 %, thus indicating the disturbances are normally distributed.

From Column1 to Column 9, the per capita variables and the demographic age population variables show consistently significant effect on private savings. As more control variables are added, GDP per capita growth and initial per capita income effects become smaller, which

**TABLE 4.2** **POOL REGRESSION ON PRIVATE SAVINGS**

	1	2	3	4	5	6	7	8	9
C	15.73**	19.65**	58.41**	55.84**	24.08*	11.32**	16.77**	23.93**	16.14**
GDP per Capita	0.42**	0.63**	0.42**	0.15**	0.27**	0.34**	0.22**	0.26**	0.16**
Growth									
Log GDP per Capita	6.67**	7.5**	2.88**	4.14**	7.43**	8.65**	6.26**	5.33**	4.99**
Youth Dependency/	-0.95**	-1.02**	-1.63**	-1.75**	-1.07**	-1.01**	-0.85**	-0.85**	-0.78**
Pop									
Old Dependency / Pop	-2.83**	-3.88**	-1.92**	-2.41**	-2.47**	-1.93**	-1.52**	-1.42**	-0.65**
Credit to Private		-0.02**	0.11**	0.1**	0.06**	0.03**	0.03**	0.03**	-0.01
Sector/GDP									
Log Real Deposit Int			-1.46**	-1.29**	-0.18	0.06	0.08	-0.26	-0.22
Log Inflation				-0.29	-1.9**	-1.37**	-1.21**	-1.37**	-0.29
Goverment Share					-0.99**	-0.84**	-0.8**	-0.66**	-0.63**
Urban Growth						-0.08**	-0.02**	-0.03**	-0.04**
Trade Opennes							0.04**	0.04**	0.12**
Remittance								-0.73**	-0.94**
Terms of Trade									0.34**
Adjusted R2	0.89	0.70	0.79	0.77	0.80	0.81	0.84	0.86	0.78
F-test	2130**	1460**	528**	471**	363**	361**	352**	389**	146**
Jarque-Bera	26.9**	23	4.8	5.8	14.8	13.9	15.6	14.4	8.1

\*\*\*significant at 1 % level

\*\* significant at 5% level

\* significant at 10% level

indicate their effect became lesser as their impacts are being mitigated by other variables, albeit still remain significant.

Private savings increase from 0.15 to 0.4 percent for every one percent increase in GDP per capita growth and likewise it increases from 5 to 6 percent for every one unit increased in log GDP per capita income as more control variables added. The positive sign in the initial per capita income also indicates that there is no convergence effect on savings in the long-term in contrast to neoclassical Solow model that hypothesises that there will be convergence effect on growth if empirically the initial GDP per capita reflect a negative coefficient. This result corresponds with previous result, i.e. Carroll and Weil, 1994; Masson et al, 1998; Schrooten and Stephan, 2005; and Aghion et al; 2006, which shows positive relationship between growth and savings as the per capita income growth increases, the population will save more. The results corresponds with LCH of the positive effect growth would have on the aggregate savings.

Young and old dependency population variables indicate negative impact at five percent significance level as hypothesised by Modigliani (1986). The youth dependency population indicates that a one percent increase in youth population would result in a decrease of between 0.8 to 1.4 percent of savings. Likewise, a one percent increase in old dependency population would result in decrease of between 0.6 to 4 percent in the population. The results reflect similarly the same by previous researchers, i.e. Soyoung and Jong-Wha, 2008; Schrooten and Stephan, 2005; Hondroyiannis and Papapetrou, 2005; Higgins and Williamson, 1996; Kelly and Schmidt, 1996; and Fry and Mason 1982. Overall, their studies reflect that the greater the increase in youth and old dependency population, the lesser aggregate private savings.

Furthermore, Higgins and Wiliamson (1996) studies indicate that the declining population of youth dependency have altered the general composition of the population that resulted in noticeable increase in overall savings and growth rates. Both variables exhibit the coefficients decreased further as the control variables such urban growth, trade openness, remittance and

terms of trade are added into the equation. This could be attributed to the increased in aggregate income contributed by these factors towards the economy, which caused diminishing negative impact the youth and old dependency have on savings.

The equation in column 3 Table 4.2 indicates that credit to private sectors ,as a proxy for financial deepening, has a negative impact on privates savings, i.e.an increased by one percent in credit to private sectors ratio would decreased private saving by 0.02 percent, *ceteris paribus*.

However, as more control variables being introduced, the sign changed from negative to positive relationship with private savings. By adding more controlling variables, i.e. inflation, government share of consumption, urban growth, deposit interest, trade openness, and remittance, the credit to private sector would significantly increase the aggregate private savings. This coefficient remain constant at 0.03 percent, which indicates that one percent increase in credit supplied has increased saving by 0.03 percent. The result concurs with the result of Cooke (2003) and Athukorala and Sen (2004) which shows positive relationship between increased in financial development with savings.

However, it contradicts studies by Chin and Ito (2007) which show an adverse impact of financial development on savings. The better developed the financial system and infrastructure of a country, the lesser is the aggregate national savings. The rationale is that the population do not have to rely to accumulate substantially in order to purchase big ticket items. With the increased financial facilities, there are a lot of opportunities for them to pay off these items using credits offered by the financial institutions. This explains the reason that the greater opportunities offered by the financial sector in seeking credit, the lesser the public need to save considerably. However, with addition of terms of trade in Column 9, domestic credit to private sector variable become insignificant, which indicate to some extent the mitigating impact of terms of trade

The next variable to be incorporated is the real interest rate (row 7 in Table 4.2). Real interest rate shows that it has a negative impact on private savings in column 3 and also column 4 with inflation added in. As the real interest rate increases by one percent, the private savings ratio declined by 2 percent. The negative relationship is indicative of income effect becoming more dominant than substitution effects as the increase in the interest rate would cause the private savings ratio to decline. In another words, the higher is the real interest rate increases, the greater is the return earned by savers, however, the lesser is the savings as the extra income would induce them to spend more. However, its impact has become insignificant as additional control variables from column 5 to 8 were introduced, i.e. government consumption, urban growth, openness, remittances and terms of trade. Therefore, it indicates that even though in Columns 3 to 4, the real deposit rate has shown significant effect on savings but its level of significance diminished rapidly as newer variables are introduced from Columns 5 to 9. The results of income effects reflect the previous findings by Loayza and Shankar (2000), in which increased in interest rates have negative impact on private savings in the short term. However, the results is in contrast with other results by Fry (1978, 1980), Gupta (1984), Ogaki et al (1996) and Masson et al. (1998) which found positive or substitution effect to be more dominant towards private savings. Other studies such as a Bandiera et al (2000) and Agrawal (2001) find there is no significant effect of interest rate on savings. As a result of vast disparity in the findings, the significance of interest rates and magnitude towards level of savings are still debatable depending on the size and type of sampling as well as the methodology being used.

Inflation rate (row 8 in Table 4.2) used as a proxy for economic uncertainties does not show any significant effect initially in the regression. However, with adding more control variables in subsequent columns, i.e. government consumption, urban growth and remittances, inflation becomes significant but negatively related to private savings. The result indicates that one percentage point increase in inflation would cause decrease between one to two percent in

savings. It can be implied that the greater the level of uncertainties, the lesser will the household save, which is in contrast with the previous studies done by Hussein and Thirlwall (1999), Loayza and Shankar (2000), Chowdry (2004) and Hondroyannis et al (2005). Their studies postulate that as the economic situation become more uncertain, the more likely the public will save more for precautionary sake. On the other hand, the negative relationship could be explained by the money spent per item. The result of inflation has caused more money needed to be spent per item than previously, which caused increased in overall aggregate private consumption that translated into lesser aggregate savings.

The equation in column 5 indicates government share of consumption variable has a significant negative impact on private savings rate. According to Ricardian Equivalence (RE) hypothesis, the lower is the government savings due to increase consumption or lower taxes, the higher is the private savings in anticipation of higher taxes that will be imposed in the future. The assumption is that the higher is the government consumption rate, the lower is the level of its savings. The result of the regression indicates reversal of the RE effect. As the result of Columns 4 to 8 indicate, the negative effect of government consumption on private savings reflects that the higher is the government consumption (or lower government savings), the lesser is the private savings. The results indicate the contemporaneous positive relationship between government savings and private savings, instead of opposite relationship based on the RE hypothesis. According to Ricardian Equivalence, the higher is government spending, the lesser will be the contemporaneous private savings. Our results are similar to the findings by Dalmagas (1992), who found positive relationships between government savings and private savings. However, the results are in contrast to other studies such as Chowdry (2004), Loayza and Shankar (2000), Edwards (1996), Corbo and Schmidt-Hebbel (1991), whose findings show negative relationship between government and private savings, which confirm with RE hypothesis. The result shows that household and private sectors in emerging economies do not increase their savings after

realising that the government would be spending more. Apparently, there is non-Ricardian Equivalence effect as they do not anticipate that the government would increase future tax to finance the current expenditure.

Urban growth (row 10 in Table 4.2) has a significant but negative impact against private savings as shown in the equation from columns 6 to 9. Based on column 6, for every increase of one percent in urban growth, there is expectation of a decrease of 0.08 percent in savings. However, as more control variables are added, the percentage of savings decreased to between 0.02 to 0.04 percent for every one percent increase in urban growth. This agrees with the analysis of Loayza et al (2000), which states that the rural folks tend to have higher savings than urban folks as future insurance as they have no other means to fallback if they fall sick, inflicted with disease or retired. In contrast to the urban population, they have other means such as health insurance and pension scheme to support them if they experienced unexpected accidents. As a result, they require lesser savings to support them compared to rural folks.

Trade openness (row 11 in Table 4.2) shows that it has positive impact on private savings as indicated in Columns 7 through 9. Based on column 8, 10 percent increase in trade openness contributed towards 4 percent increased in private savings. It denotes that the more open the economy, the lesser is import or export restrictions. This translates to greater capital mobility between countries, which affects income growth and savings.

Workers' remittances (row 12 in Table 4.2) show a significant negative effect in the regressions in Columns 8 and 9. It shows the higher is the remittances the lower is the private savings. It is in contrast to the general assumption that higher inflow of remittance into the country, the higher will be the private savings as more cash pouring in. The negative relationship indicate the inclination of the household to spend more on consumption in the expectation that more money



pouring in from remittance of their close ones working overseas. By spending more, it inevitably has dampening effect on the overall private savings.

Finally, terms of trade shows a positive coefficient indicating that the more favourable the terms of trade for the economy, the more likely is the increase in the standard of living, which translates to an increase in savings. The result is in contrast to the findings by Matsubayashi (2002) and Cashin and Dermont (2003) which found the relationship to be negative. The result in column 9 indicates that one percent increase in terms of trade would contribute to 0.34 percent improvement in savings. The results corresponds to the finding by Agenor and Aizenman (2004) and Chowdry (2004) whose result indicates that a permanent increase in terms of trade has a significant positive impact on savings.

#### **4.4.2 ROBUST TEST**

The next step is to cluster all the twenty countries into three distinct regions, i.e. Asia Pacific, Latin America and Middle East and North Africa. In this exercise, Asia Pacific comprised countries such as India, Indonesia, Malaysia, Thailand, Philippines, Singapore and South Korea. The Latin American countries consist of Argentina, Brazil, Mexico, Chile, Venezuela and Columbia. The analysis on MENA region also includes two outside countries, which are South Africa and Turkey since they are close to this region. The MENA countries include Tunisia, Israel, Morocco, Saudi Arabia, and Egypt. In another words, there will be cluster of six to seven countries in each region.

##### **4.4.2.1 Asia Pacific Region**

For SUR estimation on Asia Pacific we refer to [Table 4.3](#). In Asia Pacific region, the first three variables, i.e. per capita income growth, level of per capita income and youth dependency have shown significant effect on the private savings across the table even after adding more control

**TABLE 4.3 POOL REGRESSION ON PRIVATE SAVINGS IN ASIA PACIFIC REGION**

ASIA	1	2	3	4	5	6	7	8	9
C	-27.96***	5.86	3.41	6.41	4.64	-3.17	-18.73	34.38***	59.46**
GDP per Capita	0.12**	0.29***	0.45***	0.42***	0.42***	0.46***	0.47***	0.16*	0.38***
Growth									
Log GDP per Capita	8.08***	6.37***	6.19***	6.24***	6.35***	6.84***	9.94***	5.32***	1.66
Youth Dependency/ Pop	-0.25***	-0.79***	-0.7***	-0.74***	-0.68***	-0.65***	-0.71***	-0.96***	-0.98***
Old Dependency / Pop	0.95**	-0.64	-0.83	-1.11	-0.96	-0.58	-0.69	-2.03***	-2.35***
Credit to Private Sector/GDP		0.05***	0.06***	0.05***	0.06***	0.05***	0.04***	0.03***	0.09***
Log Real Deposit Int			1.42***	1.37***	1.4***	1.65***	1.61***	-0.42	-1.06**
Log Inflation				-0.46	-0.58	0.41	0.4	-1.48**	-1.91***
Government Share					-0.14	-0.06	-0.1	-0.06	0.3
Urban Growth						-0.05***	-0.16***	-0.03	-0.02
Trade Openness							0.03**	0**	0.04**
Remittance								-1.51***	-1.58***
Terms of Trade									0.46***

Adjusted R2	0.84	0.92	0.89	0.89	0.89	0.89	0.9	0.94	0.92
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\*\*\*significant at 1 % level

\*\* significant at 5% level

\* significant at 10% level

variables. Based on the coefficient, one percent increase in GDP growth in that regions would caused increase of between 0.16 to 0.42 percent in savings. Higgins and Williamson (1992) find that the economic growth and prosperity in Asia Pacific region have resulted in an increase in private savings. They attributed that the main factor on savings increased was attributed to decline in the fertility rate that led to the increased in the percentages of working aged population. Carroll and Weil (1994) study on 38 countries using Granger causality and find that increased in growth contributed towards increased in savings in Asia Pacific.

Youth dependency shows negative sign which is consistent with our previous empirical testing on all countries. However, old dependency variable shows an insignificant effect from Columns 2 to 7 even though the sign shows a negative relationship. The insignificance relationship between old dependency and private savings is an indication that there is mixed signal that the old dependency population has a significant effect on the aggregate private savings. Only in Columns 8 and column 9, with additional control variables, i.e. remittance and terms of trade (TOT), does the old dependency variable become significant again. The mix result indicates that old dependency population in Asia Pacific do not carry major impact in reducing the level of savings. Modigliani and Cao (2004) find old dependency do not have significant impact on savings due to different spending habit. In China, the working aged group is supposed to take care of the elders, in another words, children are considered substitute as savings as they would support the parents when the parents grew old, hence the elderly is part of an extended family living together. The elderly do not spend greatly as their needs are being cared for by their working children.

Domestic credit to private sector and real deposit interest variable shows a positive and significant effect across the board, indicative of the dominant role that these two factors in affecting the population to save more. With new policies towards liberalisation and financial

deepening in the mid 1980s in Asia Pacific and early 1990's in India, the financial deepening effects become more significant in influencing the levels of savings. Athukorala and Sen(2004) study on the determinants of savings in India and find that an increase in more bank branches as proxy for financial development has witness increased in savings. However, studies by Loayza and Shankar (2000) using credit to private sectors as proxy for financial development has found a negative relationship with savings. Fry (1978, 1980) and Gupta (1984) studies in Asia find that interest rate has positive effect on savings. The study is also confirmed by other studies in other developing countries such as by Rossi (1988) and Balassa (1992). However, Agrawal (2001) finds that an increase in savings in Asia was not mainly attributed by the interest rate effect, but rather from income growth effect. Other factors that played important role is the mandatory government retirement scheme that has spurred the saving growth.

Inflation rate however shows a very mixed signal as from column 4 to 7 as it shows insignificant effect. Only after the addition of the terms of trade and remittance, i.e. in column 8 and 9, into the equation, does the inflation shows a significant negative effect. The insignificant impact shows that even with the high inflation or low inflation, it does not seem to affect the behaviour of savings among Asia Pacific population. It can be explained that the average inflation rate in Asia Pacific region is not as high as the other emerging countries, e.g. Latin American countries, therefore it does not have significant impact on how the population saves. Other factors may have played a more significant role than inflation in affecting private savings. Findings by Agenor and Aizenman (2003) on non-oil countries in Sub-Saharan countries and others by (Corbo & Schmidt-Hebbel, 1991; Haque et al 1999; Masson et al., 1998) did not find any relationship between inflation with savings, in contrast to other finding by (Loayza and Shankar ,2000; Chowdry; 2004, and Hondroyannis et al, 2005), which find significant positive relationship between both variables.

Government expenditure variable do not have any significant impact on savings as indicated from Columns 5 to 9. This seems to imply that private savings level was not influenced by government spending contemporaneously. The public are ambivalent of the effect the current government spending has towards increased in the future marginal tax that could adversely affect their disposable income. Since government spending does not have any impact, it also meant that government savings would have similar insignificant effect on savings or the non- Ricardian Equivalence effect. It has a similar result as Haque and Montiel (1989) which found that government savings has an insignificant effect on private savings due to liquidity constraints on household budgets.

Urban growth ratio has a negative significant impact on private savings as shown in column 6 and 7. However, with the addition of two other variables, i.e. terms of trade and remittance, the negative effect of the urban growth against private savings was normalized and hence insignificant. Apparently, the terms of trade and remittance factor have become the dominant factor, which renders the effect of urban migration irrelevant in affecting private savings.

Openness variable indicates that it has a positive and significant on savings, however the effect is barely significant as indicated by the coefficient value. The coefficient indicates that one percent increase in rate of openness would result in a decrease of 0 to 0.04 percent in private savings. It signifies that with increased in open market and the influx in the import and export volume, it has decreasing impact on savings of the populations.

Workers' remittance has a significant impact on savings as depicted in Columns 8 to 9. Countries like India, Philippines and Indonesia have a significant number of workers working overseas, which would have major impact on savings. However, even though the workers' remittances have a significant impact, the signs are negative, which again implied that the household tend to spend more in lieu of expected inflow of money send by their close ones or

relatives. Terms of trade shows a positive effect indicating that the impact of favourable terms of trade has an indirect impact in enhancing the level of private savings. The effect concurs with the results by Agenor and Aizenman (2004) and Chowdry (2004), which shows that permanent increase in terms of trade has a desirable affect on private savings.

#### 4.4.2.2 Middle East and North African Region (MENA)

For MENA including Israel, Turkey and South African countries, per capita growth has mixed impact on private savings ratio as depicted in Column 3 to Column 9 in [Table 4.4](#) Only in the first two columns, per capita GDP growth depicted a significant effect at one percent level while adding more control variable render the impact of per capita growth insignificant. This can be attributed to the inconsistent per capita growth experienced by countries like Morocco, Tunisia, Turkey and South Africa that may cause no real affect on behaviour of savings as compared to other factors that are more dominant. The finding corroborated with the results by Deaton (2000) who found that growth has a negative impact on savings. His findings led to his conclusion that the extra income earned by household was instead used for household expenses rather than savings. However, per capita income in level form shows a significant and positive effect on private savings across even though additional control variables were added into the equation. The MENA youth and old dependency age groups population sizes have shown to have significant albeit negative impact on private savings. The empirical results re-confirm the LCH theory that the dependency age groups have a negative effect on private savings.

Based on the coefficients, the results indicate that one percent increase in youth dependency population ages 15 and lesser would caused 1 to 2 percent decline in savings. Similarly, one percent increase in old dependency aged group by one percent would result 1 to 2 percent decreased in savings, *ceteris paribus*. In comparison with the coefficient of the other two regions, i.e. Asia Pacific and Latin American, the negative impact of youth and old

**TABLE 4.4 POOL REGRESSION ON PRIVATE SAVINGS IN MENA REGION**

MENA	1	2	3	4	5	6	7	8	9
C	-56.96***	-43.76***	13.65	31.87***	19.35	-19.72	-41.68	-60.25***	-30.07
GDP per Capita Growth	0.5***	0.39***	0.09	-0.15	-0.18	-0.21*	-0.18	-0.12	-0.08
Log GDP per Capita	8.4***	8.63***	8.61***	7.73***	9.67***	16.38***	17.31***	20.39***	14.58***
Youth Depend/ Pop	0.21***	-0.03	-1.46***	-1.58***	-1.47***	-1.39***	-1.18***	-1.29***	-0.98***
Old Depend / Pop	-0.61***	-0.83***	-2.06***	-2.03***	-1.95***	-1.54***	-1.28***	-1.86***	-0.56
Credit to Private Sector/GDP		-0.08***	-0.09***	-0.12***	-0.11***	-0.26***	-0.26***	-0.25***	-0.24***
Log Real Deposit Int			-1.69***	-2.21***	-2.56***	-2.1***	-1.69***	-1.24*	-0.83
Log Inflation				-1.85***	-2.34***	-2.71***	-1.64**	-1.35*	-1.91***
Government Share					-0.37**	-0.4***	-0.58***	-0.62***	-0.4***
Urban Growth						-0.23***	-0.28***	-0.27***	-0.23***
Trade Openness							0.15**	0.1	0.02
Remittance								0.69	-0.06
Terms of Trade									0.57***
Adjusted R2	0.8	0.79	0.76	0.82	0.83	0.88	0.89	0.89	0.93

\*\*\*significant at 1 % level

\*\* significant at 5% level

\* significant at 10% level

dependency on savings are greater. The coefficient of youth dependency population is more than twice the impact as compared to the other two regions, i.e. more than one percent impact on savings in MENA region as compared to lesser than one percent in the other two regions. Credit to private sectors also shows a significant impact on private savings. However, instead of positive signs, it is showing negative signs, which meant that the more financial deepening occurred in the countries the lesser is private savings. The underlying reasons of this phenomenon in contrast to the general conclusion is that most of these countries Egypt, Turkey, Tunisia, Morocco, Saudi Arabia and Israel private savings ratio are showing either decline or unchanged trend since 1970. Meanwhile, the domestic to private sector trend seems to move in a gradual upward trend and, henceforth explained the negative relation. It also indicates that with lesser financial development, and lesser opportunities to buy expensive items from banks credit, there is tendency for the MENA population to accumulate saving to buy these items by cash.

The real deposit interest rate in MENA region, Turkey and South Africa indicates that it plays a very significant role as all the regressions across the table show significant but negative effect, except for the last column. With the negative effect, it means that the income effect indeed is more dominant than the substitution effect.

The inflation also shows a significant negative relationship, which is similar to the main empirical findings of the 20 emerging economies. Compared to the result in Asia Pacific region in which its inflation do not have significant impact on savings, the inflation in MENA region shows significant negative relationship across all the equations. Descriptive-wise, on average the inflation rate in Asia Pacific is rather mild compared to the one experience in MENA region, includes Turkey and Israel reached inflation more than 100 percent. Given the high inflation prevalent in most of the period throughout the 1980s and 1990s, most of the population won't



have enough money from their income for savings as large proportion of their income is spent on daily expenses that have experienced rapid price increase.

The MENA government share on consumption shows a significant negative impact on private savings. In other words, the more the government consumes and spends, the lower is the rate of private savings. The empirical result is in contrast to the Ricardian Equivalence hypothesis, which stated that the more government spending, the greater contemporaneous level of savings by the public in anticipation of higher taxes by the government. The findings depicts that the population are not too concern about the impending tax rise to their disposable income, in so much as they are willing to increase instead of cutting their spending. This also implies that the public could not grasp the impact of future marginal tax increase on their income to enable them to save more to compensate the loss of purchasing power. In other words, it is assumed that the public are imperfect to perceive tax implications of government spending (Seater, 1993).

The urban growth variable show that is has a significant but negative impact on private savings on all regressions across the table, which is similar to the previous finding. In contrast to the Asia Pacific region, which depicts mixed results after adding more control variables, the MENA urban growth variable shows a definite negative impact at one percent significance level. On average it shows that with the increased of urban growth by one percent, it would result decline by 0.2 to 0.3 percent of private savings, *ceteris paribus*. This confirms the finding by Loayza et al (2000), which found that urban workers tend to have lesser savings rate than its rural counterpart.

Trade openness factor variable shows a mixed result as the regression in Column 7 shows it played a significant positive impact, however, columns 8 and 9, with additional control variables of terms of trade and workers' remittances, the result turns insignificant. The result indicates that trade openness does not seem to play major role in directly or indirectly affecting the people to save.

The result from workers' remittances variable shows that it has insignificant relationship with private savings, which in contrast to the findings in the macro analysis in Chapter 2. Based on the macroeconomic analysis, Morocco, Tunisia, Turkey and Egypt have relatively significant number of its workers migrated overseas to find employment, and hence the level of remittance receive should be high, which would have significant effect on the level of private savings in the country. The insignificance result may indicate that other variables such as government expenditure, inflation and urban growth might have a greater effect on private savings, in which it overwhelmed the effect of remittances.

Terms of trade variable indicate positive significant result on private savings as the result is in the same as studies done by Agenor and Aizenman (2004)

#### 4..4.2.3 Latin American Region

GDP per capita growth in Latin American countries, similar to MENA region, shows a rather mixed result on private savings as shown in Table 4.5. Columns one to three and seven to nine reveal that per capita growth has a significant positive impact on private savings, while column four to six, show the impact of per capita growth is insignificant. Based the trend analysis, most of the GDP per capita growths in most Latin American countries are either low or erratic, except Chile, from the middle 1970s until early 2000s. With the unpredictable and low income growth, it helps to explain the insignificant impact on savings as there is no surplus income to be allocated for savings. On the other hand, per capita income in the level form shows a significant positive affect towards the private savings as shown in the regression from column 1 to column 9. The result is similar to the other two regions. It reconfirms the notion that the greater is the per capita income, the greater is its impact in positively affecting the rate of private savings.

**TABLE 4.5 POOL REGRESSION ON PRIVATE SAVINGS IN LATIN AMERICA REGION**

LATIN	1	2	3	4	5	6	7	8	9
C	-71.76***	-79.64**	-39.99***	-25.81***	3.04	-53.02***	-79.09***	-84.09***	-61.18***
GDP per Capita	0.09*	0.05	0.19*	0.08	0.09	0.08	0.1**	0.1**	0.13***
Growth									
Log GDP per Capita	12.05***	12.72**	6.51***	8.33***	7.64***	11.16***	11.15***	11.43***	9.28***
Youth Dependency/ Pop	0.04	0.08	-0.01	-0.67***	-0.88***	-0.33**	0.06	0.11	0.08
Old Dependency / Pop	-1.56***	-1.55**	0.44	-0.84**	-1.67***	-0.78**	-0.07	0.11	-0.14
Credit to Private Sector/GDP		0.03**	0.13***	0.07***	0.07***	0.04***	0.02**	0.02**	0.02**
Log Real Deposit Int			-1.39***	-1.37***	-0.51**	-0.92***	-0.57***	-0.59***	-0.75***
Log Inflation				1**	-0.08	0.31	0.7***	0.69***	0.81***
Government Share					-0.8***	-0.7***	-0.52***	-0.53***	-0.55***
Urban Growth						0.08***	0.08***	0.09***	0.06***
Trade Openness							0.13***	0.12***	0.12***
Remittance								0.31	-0.47
Terms of Trade									0.33***
Adjusted R2	0.75	0.78	0.72	0.63	0.84	0.92	0.92	0.92	0.94

\*\*\*significant at 1 % level

\*\* significant at 5% level

\* significant at 10% level

Youth and old dependency populations against private savings shows mixed results as half of the equations, from column 4 to 6, show significant negative result, while the rest, column 7 to 9, show insignificance.

The mixed results might be indicative of the fact that other variables, e.g. trade openness, terms of trade, and real deposit rate play a more dominant effect, as shown in Columns 3, 7 and 9, which may render the youth dependency variable to become insignificant. Unlike Asia Pacific and MENA region, in which the youth dependency population shows negative significant impact on private savings, the mix result in Latin American region indicates that the youth dependency population played minor role in affecting savings.

Credit to Private sector variable, similar to MENA and Asia Pacific region, indeed shows a significant positive impact towards private savings in all equations across the table. It shows the dominant role that financial deepening in affecting positively toward the behaviour of private savings. Major deepening and restructuring of the financial sector in the middle to late 1980s in most Latin American countries has positively affected the level of private savings. On average a one percent increase in domestic credit to private sector ratio would result in increased by 0.02 to 0.13 percent of private savings.

Real deposit interest rate also has a significant negative impact towards private savings. The empirical result is similar to other regions, in which all show a negative significant impact which can be attributed to income effect.

Inflation affects on savings shows mixed result as equations in column 7 to 9, shows significant positive impact, while equations in Columns 5 and 6, show an insignificant effect. The mixed result is similar to Asia Pacific region, however, different from MENA region which shows significant positive results. The insignificant results show that inflation, as a proxy for period of

uncertainty, do not have any impact on savings. The population did not take precautionary measures to save more from high inflation that prevailed in Latin American from mid 1970s until middle of 1990s. Overall, the mix result indicates that inflation has an insignificant impact on savings and even if there is an impact, it would be only minor.

Government consumption explicitly shows a significant but negative relationship on private saving, similar to MENA region, which is reverse to RE effect. Similar to previous explanation, either the public may not be fully aware that the impact of current government spending or they are just ambivalent to realise the effect it will have on the future tax increased due to the government overspending. Dalamagas (1992) and Hondroyannis (2005) find that in low debt countries, the government savings or surplus seem to have positive effect on private savings as the public are considered myopic and debt illusion.

Urban growth and openness variables also show significant positive relationship towards private savings. Interestingly, unlike in MENA and Asia Pacific region, urban growth variable in Latin region shows a positive relationship, i.e. the greater the urban population, the greater are the savings. Latin America openness variable shows unequivocal significant positive relationship towards private savings. One percent increase in openness resulted in 0.12 to 0.13 percent increased in private savings over GDP. Compared to Asia Pacific region, the Latin openness coefficient is 3 to 4 times bigger than Asian, which imply that increased in one percent of openness ratio, would have 3 to 4 times bigger impact towards private savings in Latin America than Asia Pacific region.

Workers' remittances variable, like in MENA region, does not indicate any significant impact on private savings. Unlike the MENA region, the percentage of workers' remittances to GDP in Latin America is too small to have a significant impact on private savings. Finally, terms of trade shows a positive significant impact towards private savings, similar to other regions. It is

also similar with the finding from the main, in which a one percent increase in terms of trade would result 0.34 percent increase in private savings.

## **4.5 CONCLUSION**

Based on the main results for all the emerging economies, the GDP growth, and financial development variable, i.e. credit to private sector, show a significant positive relationship with savings, albeit their coefficient diminishes as more variables added. Youth and old dependency variables show a negative effect on savings in all the equations, which support most savings theories. Real interest rate became insignificant as the equation was augmented which indicate lesser role it has on savings when other economic factors are involved. Urban growth has shown a negative impact indicating that as more migration the lesser will be the rate of savings. The trade openness and terms of trade indicate that both have significant effect, which meant that as the country reaps benefits from increased trading and improved terms of trade, the population would experienced an increase in real income, that would translate into improved savings. However, inflow remittance shows a negative impact on savings indicating that the extra income earning are being channelled more into consumption rather than savings.

By applying a similar test on the Asia Pacific region, the results are mostly similar to those tested on all 20 emerging economies, i.e. [Table 4.2](#), except for old dependency which shows mixed results with several equations show insignificance effect, while others show negative effect on savings. According to Schultz (2004), the elderly in the region tend to stay together in an extended household and those over 59 tend to have greater wealth and save more.

Government share, or government expenditure over GDP shows an insignificant effect on private savings. It indicates that the population are ambivalent on the increased spending by the government, therefore they are unconcerned about the possibility of increased taxation in the

future. Remittance inflow variable shows a negative impact on savings, which meant that aggregates savings decline as remittance increased.

However, in the MENA region, the GDP per capita growth, trade openness and remittances do not show any significant effect on savings. It seems that trade openness and remittances have not been able to generate enough surplus income to positively affect the saving's level. GDP per capita growth shows a positive effect on savings as similar to the Life Cycle Hypothesis (LCH). However, youth and old dependency show a clear negative impact on savings in all equations as expected according to LCH. Credit to the private sectors also shows a negative impact, which indicates the increased in financial deepening caused lesser savings as more opportunities available to obtain loans to purchase big ticket items. Inflation and real deposit interest rate also show a negative impact indicating the higher the inflation or greater is the economic uncertainties, the lower is the level of population savings. The negative impact of interest rates indicates the income effect as increase in savings cause people to spend. Urban growth also shows a negative effect as increase in urbanization of areas and migration to urban areas caused people to save less. This is due to social insurance available in urban areas, such as pension funds and hospitalization plan that resulted people to save less for contingency. An increase in government share or expenditure also has a negative impact on savings, which also implies that government savings have a positive effect on private saving. In another words, it is reverse to the Ricardian Equivalence effect. Finally, terms of trade shows a positive impact on savings as the more favourable the terms of trade, the lesser to pay for imports in real terms, which contribute to surplus income that can be set aside for savings.

In Latin America region, the youth dependency shows mixed results as more variables being augmented into the equation, the relationship become insignificant. Like the MENA region, Latin America inflow remittances show an insignificant relationship with savings. Unlike other

regions, urban growth in Latin America has a positive effect on savings, which indicates that with an increase in income the greater is the propensity to save.

Overall, the results from SUR regressions indicate that the macroeconomic variables, i.e. GDP growth, per capita income, inflation, real interest rates, trade openness and terms of trade have mostly shown significant effects on the level of private savings for the emerging economies. In contrast, the demographic variables, i.e. old and youth dependency ratios, show mixed results. For example, old dependency shows an insignificant effect on savings in Asia-Pacific region, , while in Latin America it is the youth dependency that shows an insignificant effect on savings. Furthermore, urban growth in Asia Pacific and MENA region shows a negative relationship, while in Latin America it shows a positive impact on savings. Apparently, Asia Pacific and MENA regions have experienced increased in savings, in contrast to decline in savings in Latin American Region, due to greater migration to urban areas. The inflow remittance variable shows an insignificant effect on savings in MENA and Latin American regions, but has a negative relationship with savings in the Asia Pacific region.



## **CHAPTER 5**

# **FINANCIAL DEVELOPMENT AND GROWTH: A COINTEGRATION ANALYSIS**

### **5.1 INTRODUCTION**

Most of the studies on savings incorporate financial development and growth. However, the main question remains: what is the relationship between financial development and income growth or level of income as these variables relate to savings? Are there any indirect linkages between financial development and income or growth on savings? In other words, there can be two scenarios: (i) Does financial development affect savings indirectly via its effect on income level or (ii) Does income level affect savings indirect via its effect on financial development? Therefore in this chapter, we would analyse the relationship between financial development and its relationship with level of income in the context of selected emerging economies.

There have been numerous studies that have been conducted on financial development and income growth relationship. Different studies involved different sample size of countries, and different types of methodology. Some of the studies conducted analyse the relationship between financial development and financial are as follows:

### **5.2 METHODOLOGY AND DATA DESCRIPTION**

Our objective is to find short term and long term directional causality between financial development and income growth in order to understand which variables take precedence first. We would apply the Vector Auto Regressive (VAR) and Error Correction model (ECM) to determine the short and long-term causality effects. Before proceeding with this model, we have to identify the integration order of each variable as we need to know whether it is of the correct

order of integration and not spurious to the model. We will use credit to private sector over GDP and log GDP per capita income as a proxy for financial development and income growth, respectively. Both variables are taken from World Development Indicators (WDI).

In order to use the VAR method, both variables need to be transformed as stationary processes, otherwise, the result would not be meaningful. A non-stationary variable or order of integration one can be transformed into stationary variable by first differencing. However, by differencing, according to Granger (1986), the long-term trend within the data would be cancelled out and only the short-term result would show.

### 5.2.1 Unit Root Test

We proceed to test the variables to determine whether they are stationary or nonstationary (unit root) variables by finding out the order of integration. The data is considered nonstationary if it is spurious or non mean reverting when a shock is applied on it. After the variable is differenced by  $k$  times before it becomes stationary then it is said to be integrated to the order of  $k$  or  $I(k)$ .

The work on unit root testing in times series data was first pioneered by Dickey and Fuller (1979, 1981), who derive a  $T$  test (known as the DF test) based on the model which can be written as  $\Delta y_t = \omega y_{t-1} + \mu + \theta t + \mu_t$ . The test assumes that  $y_t$  is a random walk and is not autocorrelated. If  $y_t$  is found to be autocorrelated, the solution is to apply  $p$  lags on the variables that can lead to the augmented Dickey-Fuller (ADF) test.

The augmented Dickey Fuller model can be written as follows:  $\Delta X_t = \alpha + \gamma T + \beta X_{t-1} + \sum_{i=1}^p \alpha_i \Delta X_t + \varepsilon_t$ . It is important to apply the correct number of lags as too few lags will not remove all the autocorrelation, thus skewing the results. On the other hand, too many lags will increase the coefficient of standard of errors due to the increase in the degrees of freedom, which will inevitably reduce the test power. This will then result in the null hypothesis being rejected

less frequently. These tests are conducted on the presumption that the null hypothesis has unit root in the data series and the alternative is stationary.

The other common unit root test is the Phillips-Perron test, which is similar to ADF but with automatic correction to allow for autocorrelated residuals (Phillips and Perron, 1988). It incorporates a nonparametric adjustment to the t-test to deal with autocorrelation when the data is not AR(1). Its null hypothesis is similar to that of the ADF test with unit root present in data series against the alternative which has none.

Since this study is on panel data, the appropriate test for the order of integration needs to be rooted within the panel unit root testing model rather than a single unit root test. According to Baltagi (2008), the panel data unit root test gives a better estimate for the cross-sections (N) and time (T) dimensions as both of them tend asymptotically towards infinity. The panel estimator tends to average across the individuals and the power of panel unit-root test increases with an increase in N. The increase in power is more robust than the single test applied on DF and ADF tests for small samples.

Levin and Lin (LL, 1992) developed a unit root test based on the following equation.  $\Delta Y_{it} = a_i + \rho Y_{i,t-1} + \sum_{k=1}^n \varphi_k \Delta Y_{i,t-k} + \delta_i t + \theta_t + \mu_{i,t}$ . The model allows for two fixed effects in the same equation, denoted by  $a_i$  and  $\theta_t$ , which are unit specific fixed effects and unit specific time trends. The unit specific fixed effect is important as it allows for heterogeneity across all units of the panel as the coefficient of the lagged  $Y_i$  is restricted to be homogeneous across all units of the panel. LL presumes that each cross section is independent and LL test is assumed to reflect a pool DF and ADF test.

The LL null hypothesis is the variable contains unit root against the alternative without unit root. According to Baltagi (2008), LL's assumption is based on the independence of the units across

sections and is rendered irrelevant if cross sectional correlation is present. O'Connell (1998) also shows that LL suffered from significant reduced size distortion due to contemporaneous cross correlation among the error terms.

Im, Pesaran and Shin (1997) (IPS) extended the LL test by allowing for heterogeneity on the lag coefficient of  $Y_{i,t-1}$  variable. The test is based on averaging the individual unit-root test statistics which is basically averaging the individual ADF t-statistic. It allows for separate estimation of each cross section by estimating disparate parametric values for the residual variance and the lag lengths. The model is specified as follows:  $\Delta Y_{it} = \alpha_i \rho_i Y_{i,t-1} + \sum_{k=1}^n \varphi_k \Delta Y_{i,t-k} + \delta_i t + \theta_t + \mu_{i,t}$ .

The null hypothesis is the same as LL test where all series are stationary, however, the alternative is only a certain fraction of the series is stationary as opposed to LL alternative test, which all series are stationary. According to Baltagi (2008), if there is large enough lags in the ADF regression, the IPS t-test performs better than LL test.

Maddala and Wu (1999) proposed a Fisher-type test, i.e.  $P = -2 \sum_{i=1}^N \ln p_i$ . It combines the unit root test from N unit root tests done on N cross sections in the panel data. The test has  $\chi^2$  distribution with 2 degrees of freedom as  $T_i \rightarrow \infty$  for finite N. The Fisher test unlike IPS test does not need to have a balanced panel. Different lag lengths can be applied with the independent ADF regressions and can be used with other unit root tests. Maddala and Wu (1999) find that the Fisher test with the bootstrap based critical values performs the best and is the preferred choice for testing nonstationary and also in testing for cointegration in panel data. Both of them find that the test is more powerful than the IPS test which is considered more powerful than the LL test.

### 5.2.2 Vector Autoregressive (VAR) Method

Sims (1980) criticised the structural modelling approach for predetermining the variables into endogenous and exogenous and impose unnecessary restrictions for identification. Instead, VAR model is most suitable to forecasting time-series under the assumptions that all the variables are endogenous. Accordingly, if two variables are not cointegrated than the conventional Granger causality test are valid to be used within VAR framework. However, if the two variables are cointegrated than the VECM framework can be applied to study the long term relationship between two variables.

VAR equation can be illustrated as below

$$y_t = a_0 + a_1y_{t-1} + a_2y_{t-2} + \gamma_0x_t + \gamma_1x_{t-1} + \dots \quad \textbf{Equation 5.1}$$

$$x_t = \delta_0 + \beta_1y_{t-1} + \beta_2y_{t-2} + \rho_0x_t + \rho_1x_{t-1} + \dots \quad \textbf{Equation 5.2}$$

It is assumed that  $y_t$  is affected by the past values of  $x_t$  and  $y_t$ . At the same time,  $x_t$  is affected by the past values of the  $y_t$  and  $x_t$  series. Based on the above equation, by controlling past  $x$  and past  $y$ , it help to forecast future  $y$ . Accordingly, it can be termed that “ $x$  Granger causes  $y$ ” if past  $x$  and past  $y$  is useful to predict  $y$ . Generally it is said that  $x$  Granger causes  $y$  if past  $x$  is useful in addition to past  $y$  for predicting  $y_t$ . However, it has nothing to say about contemporaneous causality between  $y$  and  $x$ , or it does not allow us to determine whether  $x_t$  is an exogenous or endogenous variable in an equation relating to  $y_t$  to  $x_t$  (Wooldridge, 2005). There are several pros and cons in applying VAR to determine causality. The advantages are:

- i. You need not specify a variable is exogenous or endogenous beforehand. It also does not require for restrictions to be imposed as arbitrary restrictions can cause some vital information to miss out in the mist of regressing the equation

- ii. VAR allows various forms of variables into the equation and not solely depended on its own lag. VAR equation is expected to be overly parametrized, in which most of the coefficient would be removed from the model.
- iii. Each equation can be estimated without bias by using OLS as the variables are asymptotically efficient and considered stationary.

While the disadvantages are:

- i. VAR tend to rely less on underlying theory to provide specification to the equation. There is tendency for data mining as researchers tend to achieve results that are congruent to his earlier expectations.
- ii. If there are  $k$  equations, and each with  $m$  variables and with  $n$  lags for each  $m$  variables, then there will be  $(k + nm^2)$  parameters to be estimated. There will be loss of degree of freedom as too many lags specified, especially on small size samplings. It would also result in large standard errors and wide confidence intervals for the specified coefficients.
- iii. The VAR in its true form should be limited to stationary variables. However, if the variables are not stationary, there are those who believe it should remain at its level form and not subjected to any differencing. They argue that any actions to difference would erase the long term information imbedded in the variable and maintain that it should consist of combinations of level and first difference forms.

### 5.2.3 Cointegration Method

VAR using Granger causality only shows short-term bivariate causality effect among the variables. Only the variables, which are originally are stationary without any differencing will show long term bivariate causality. In order to test the long term correlation between non-stationary variables, they have to be subjected to the test of cointegration. Then error correction

model will be used to identify the long-term direction of the causality by applying the necessary restrictions.

Two types of cointegration methods can be used. One is the Pedroni- Granger based cointegration method and the more rigorous is the Johansen method. If there is cointegration, then the next step is to proceed to identify the exogeneity of the variable by using the Johansen error correction model.

### 5.2.3.1 Pedroni Cointegration Method

Pedroni (1997, 1999 and 2000) propose several tests for cointegration in panel data, which allows extensive heterogeneity. Pedroni's test allow for multiple regressors for the cointegration vector to vary across different sections of the panel and also for heterogeneity in the errors across cross sectional units. The panel regression model can be written

$$Y_{it} = \alpha_i + \delta_t + \sum_{m=1}^M \beta_{mi} X_{mi,t} + \mu_{it} \quad \text{Equation 5.3}$$

Seven different cointegration statistics are proposed to capture the within and between effects in his panel and his tests can be classified into two categories. The first category includes four tests based on pooling the 'within' dimension. The within estimator shows the variation from observation to observation within a single individual.

The null hypothesis associated with the first four statistics is that  $\rho_i = 1$  against the alternative that  $\rho_i \leq 1$  for all cross-sectional units of the homogeneous panel. Specifically, the four statistics test the null hypothesis of no-cointegration for all cross-sectional units versus the alternative of the existence of cointegration for all cross sectional units.

The second category includes test based on pooling the 'between' dimension in which averaging the AR coefficients for each member of the panel for the unit root test on the residuals. The

between or group statistic indicate the variation in observation between individuals or samples.

The null hypothesis tested is the same as in the previous case while the alternative is equal to  $\rho_i < 1$  for all cross section so it permits distinct slope values or heterogeneity in the panel.

Specifically, Pedroni base his test on the average of the numerator and denominator terms rather than the whole average of the statistic .Pedroni (1999) derived asymptotic distributions and critical values for several residual based tests of the null of no cointegration in panels where there are multiple regressors.

#### 5.2.3.2 *Johansen-Jesulius (JJ) Cointegration Method*

JJ procedure commands several advantages over Eagle-Granger cointegration mainly i) unlike Eagle-Granger cointegration, JJ will test to discover several cointegrating relationship rather than constraining to only one (ii) JJ assumes that every variables is endogenous , unlike Eagle-Granger procedure that is sensitive to the choice of variable selected to become the dependant variable. JJ provides proper statistics to test hypothesis for the number of cointegrating vectors and tests of restrictions upon the coefficients of the vectors.

For a single time series with multiple variables, the JJ method is an ideal test to determine the number of cointegration involved prior to using vector error correction (VECM) model to determine the direction of the long run causality. The error correction model implies that changes in the dependent variable as a deviation from the long run equilibrium depend on the cointegration relationship. The Johansen method estimates the number of cointegrating as shown in the following vector autoregressive model which involves the identification of rank of  $n$  by  $n$  matrix .

$$\Delta X_t = \Gamma_1 \Delta X_{t-1} + \dots + \Pi_{n-1} \Delta X_{t-n+1} + \Pi x_{t-n} + \mu_t + \beta z_t + \epsilon_t \quad \textbf{Equation 5.4}$$



Where  $X_t$  is a column vector of the  $m$  variables,  $\Gamma$  and  $\Pi$  represent coefficient matrices, and  $\Delta$  is difference operator. Two methods to determining the number of cointegration relations, which involves estimating the matrix  $\Pi$ , with  $n \times n$  matrix with  $r$  rank. One method is test the null hypothesis that Rank ( $\Pi$ )=  $r$  against the hypothesis that rank is  $r+1$ .

The test is based on the characteristic roots (called eigenvalues) obtained from the estimation procedure. Where  $r$  is the number of cointegrating vectors under the null hypothesis and  $\lambda$  is the estimated value for the  $i$ th ordered eigenvalue from  $\Pi$  matrix. The eigenvalues,  $\lambda$ , are arranged in ascending order  $\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_n$ . The real test to calculate the number of cointegration or the rank of the  $\Pi$  matrix is to examine the number of eigenvalues or the characteristic roots. The rank of matrix is based on the number of eigenvalues that are different from one. The eigenvalues,  $\lambda$ , will be largest when it is close to one while  $\lambda$ , will be smallest when it is closer to zero.

If  $\Pi$  has rank of zero, no stationary relationship is established or no cointegration. All the characteristic roots will equal zero, therefore  $(1 - \widehat{\lambda}_n)$  will equal to 1 and since  $\ln(1) = 0$ , there will no cointegration. If the variables are not cointegrated, the rank of  $\Pi$  will not be significantly different from zero. Intuitively the larger is  $\lambda$ , the larger and negative will be  $\ln(1-\lambda)$  and hence the larger will be the test statistic. Each eigenvalue will associate with different cointegrating vector, which will be eigenvectors. A significantly non-zero eigenvalue indicates a significant cointegrating vector.

The following test statistic named, maximum eigenvalue or  $\lambda_{mx}$  is used to test the number of characteristic roots are significantly different from zero.:

$$\lambda_{max}(r, r+1) = -T \ln(1 - \widehat{\lambda}_{r+1}) \quad \text{Equation 5.5}$$

The second method is the trace statistic.  $\Lambda_{\text{trace}}$  is a joint test where the null is that the number of cointegrating vectors is less than or equal to  $r$  against an unspecified or general alternative that there are more than  $r$ .

When  $\hat{\lambda}_n = 0$ , then the trace statistic is equal to zero. The nearer is the characteristic roots to unity, the more negative is the  $\ln(1 - \hat{\lambda}_n)$  and the greater is the trace statistic. The trace statistic can be shown as below:

$$\lambda_{\text{trace}}(r) = -T \sum_{i=r+1}^g \ln(1 - \lambda_i) \quad \text{Equation 5.6}$$

If the test statics is greater than the critical value from Johansen's table, reject the null hypothesis that there are  $r+1$  (for  $\lambda_{\text{trace}}$ ) or more than  $r$  (for  $\lambda_{\text{max}}$ ). If  $\Pi$  has zero rank, then by analogy to the univariate case,  $\Delta X_t$  depended only on  $\Delta X_{t-n}$ , so that there is no long run relationship between elements of  $X_{t-n}$ . Hence there is no cointegration. For  $1 < \text{rank}(\Pi) < n$ , there are  $r$  cointegrating vectors

#### 5.2.4 Error Correction Method (ECM)

If the rank of  $\Pi$  is greater than zero, then  $\Pi$  may be decomposed into two matrices  $\alpha$  and  $\beta$  in such that  $\Pi = \alpha\beta'$ , with the dimension  $(n \times m)$  and  $(m \times n)$ , respectively, i.e.

$$\Pi = \alpha\beta' \quad \text{Equation 5.7}$$

As noted  $\Pi = \alpha\beta'$ , where  $\alpha$  represents the speed of adjustment to disequilibrium. It represents the feedback effect and how much of the disequilibrium is corrected, i.e. in which the extent to which any disequilibrium in the previous period effects and adjustment in  $\Delta Y_t$ .  $\beta$  is a matrix of long run coefficients. Long run that is employed in econometrics implies that the variables have converged upon some long-term values and are no longer changing, thus  $y_t = y_{t-1} = y$ ;  $x_t = x_{t-1} = x$ . Hence all the difference terms will be zero, i.e.  $\Delta y_t = 0$ ,  $\Delta x_t = 0$ , and thus everything in the

equation cancels. The error correction model has the ability to converge the x and other variables towards equilibrium relationships, as shown below:

$$\Delta Y_t = \alpha_0 + \gamma_0 X_t + \pi[Y_{t-1} - \beta_{t-1}] + \mu_t \quad \text{Equation 5.8}$$

Where:  $\pi < 0$ , If  $y_{t-1} > \beta x_{t-1}$ , then y in the previous period has overshoot the equilibrium; because  $\pi < 0$ , the error correction term works to push y back toward the equilibrium.

If there is  $r \leq (n-1)$  cointegration vectors, then this means that the last  $(n-r)$  column of  $\alpha$  are zero,. In order to determine how many  $r \leq (n-1)$  exist in  $\beta$ , is similar to testing which column of  $\alpha$  is zero.

The effect of error correction can also be illustrated from the re-parameterization of the autoregressive distributed lag (ARDL).

$$\text{Let: } Y_t = a_0 + a_1 y_{t-1} + \gamma_0 x_t + \gamma_1 x_{t-1} + \mu_t \quad \text{Equation 5.9}$$

In which the residual  $\mu_t = iid(0, \sigma^2)$  and  $\gamma_0$  denotes the short run change of  $Y_t$  due to changes in  $X_t$ . The long run model at its equilibrium is when

$$X_t^* = X_t = X_{t-1} = \dots = X_{t-p} . \quad \text{Equation 5.10}$$

Let equation 5.9 be transformed based on assumptions of Equation 5.10

$$Y_t^* = a_0 + a_1 Y_t^* + \gamma_0 X_t^* + \gamma_1 X_t^* + \mu_t$$

$$Y_t^*(1 - a_1) = a_0 + (\gamma_0 + \gamma_1)X_t^* + \mu_t$$

$$Y_t^* = \frac{a_0}{1-a_1} + \frac{\gamma_0+\gamma_1}{1-a_1}X_t^* + \mu_t$$

$$Y_t^* = \beta_0 + \beta_1 X_t^* + \mu_t \quad \text{Equation 5.11}$$

Therefore, the elasticity of the long term equilibrium state is represented by  $\beta_1$  or

$\gamma_0 + \gamma_1 / 1 - a_1$ . However, the assumption was that  $a_1$  is less than 1 in order for the short-run to

converge towards long run trend.

Similarly, error correction model can be derived from same ARDL equation 5.9. Let:

$$Y_t = a_0 + a_1 Y_{t-1} + \gamma_0 X_t + \gamma_1 X_{t-1} + \mu_t$$

$Y_t - Y_{t-1} = \gamma_0 X_t - \gamma_0 X_{t-1} - Y_{t-1} + a_1 Y_{t-1} + a_0 + \gamma_0 X_{t-1} + \gamma_1 X_{t-1} + \mu_t$  (By adding  $Y_{t-1}$  and  $\gamma_0 X_{t-1}$  into the equation)

$$\Delta Y_t = \gamma_0 \Delta X_t - (1 - a_1) Y_{t-1} + a_0 + (\gamma_0 + \gamma_1) X_{t-1} + \mu_t$$

$$\Delta Y_t = \gamma_0 \Delta X_t - (1 - a_1) \left[ Y_{t-1} - \frac{a_0}{1 - a_1} - \frac{(\gamma_0 + \gamma_1)}{1 - a_1} X_{t-1} \right] + \mu_t$$

$$\Delta Y_t = \gamma_0 \Delta X_t - \pi \left[ Y_{t-1} - \frac{a_0}{1 - a_1} - \frac{(\gamma_0 + \gamma_1)}{1 - a_1} X_{t-1} \right] + \mu_t \quad \text{Equation 5.12}$$

Let  $\beta_0 = \frac{a_0}{1 - a_1}$ ;  $\beta_1 = \frac{(\gamma_0 + \gamma_1)}{1 - a_1}$  and  $\pi = (1 - a_1)$ ; hence

$$\Delta Y_t = \gamma_0 \Delta X_t - \pi [Y_{t-1} - \beta_0 - \beta_1 X_{t-1}] + \mu_t \quad \text{Equation 5.13}$$

The ECM captures both short-run as well as the long run effect. The short run effect is captured

by the differenced terms  $\gamma_0 \Delta X_t$  and the long run elasticity was captured by  $\frac{(\gamma_0 + \gamma_1)}{1 - a_1}$ , which

contains all the long term relationship. All the figures are assumed to be stationary in ECM,

therefore the standard OLS can also be applied to the equation. On the other hand, as long as  $Y_t$

and  $X_t$  are cointegrated, then  $\left[ Y_{t-1} - \frac{a_0}{1 - a_1} - \frac{(\gamma_0 + \gamma_1)}{1 - a_1} X_{t-1} \right]$  will be  $I(0)$  even though the terms are

$I(1)$ .

When the terms are not at equilibrium, the coefficient  $\pi$  or  $(1 - a_1)$  will act to revert back to its equilibrium.  $\pi$  or  $(1 - a_1)$ . The model is at its equilibrium state when  $(Y_{t-1} - \beta_0 - \beta_1 X_{t-1}) \sim 0$ . However, during period of disequilibrium this term will no longer be zero and the difference measures the distance from equilibrium. Suppose that there was a negative shock to the economy and is captured by the error term,  $u_t$ . Assume that  $Y_t$  began to rise lesser than normal in the model. It then resulted  $(Y_{t-1} - \beta_0 - \beta_1 X_{t-1})$  to turn negative as  $Y_{t-1}$  moved below its long-run steady state growth path. However, since  $\pi = (1 - a_1)$  is positive due to the minus sign in front of  $\pi$ , it pushes back  $\Delta Y_t$  towards equilibrium path via  $X_t$  in the equation. Hence, the speed of this adjustment to equilibrium is dependent upon the magnitude of  $(1 - a_1)$ .

Essentially  $\pi$  represents the adjustment coefficient, which provides the degree of adjustment to equilibrium in each period. In other words, it informs how much of the equilibrium error is subjected for corrections. Therefore, if:

- i.) If  $\pi$  is equal to 1, then 100 percent of the adjustment occur within one period or in full
- ii.) If  $\pi$  is equal to 50 percent, then only 50 percent of the adjustment took place in that period.
- iii.) If  $\pi=0$ , then there no readjustment back to the equilibrium state.

## 5.3 EMPIRICAL FINDINGS

### 5.3.1 Short-run Causality

The result of the panel unit root testing shows that both credit to private sector and GDP income per capita has unit root. We then proceed to determine the order of the unit root. The result indicate that only after both variables are being differenced, both transformed into stationary and this indicate both of them are I(1) variable. Log GDP per capita and credit to private sector requires 2 and 4 lags of differencing, respectively, using Schwarz Information Criterion (SIC) for both to become stationary variable. (Refer to [Figure 5.1](#) in the next page)

## UNIT ROOT TEST

**FIGURE 5.1**

Variable: Credit to Private Sector

Variable: GDP Per Capita

<p>Panel unit root test: Summary  Series: D(_3CRD_PRV)  Date: 03/11/10 Time: 13:38  Sample: 1 760  Exogenous variables: Individual effects  Automatic selection of maximum lags  Automatic selection of lags based on SIC: 0 to 4  Newey-West bandwidth selection using Bartlett kernel</p>					<p>Panel unit root test: Summary  Series: D(_2LGDP_CAP)  Date: 03/12/10 Time: 11:20  Sample: 1 760  Exogenous variables: Individual effects  Automatic selection of maximum lags  Automatic selection of lags based on SIC: 0 to 2  Newey-West bandwidth selection using Bartlett kernel</p>				
Method	Statistic	Prob.**	Cross- sections	Obs	Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)					Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-14.91	0	20	666	Levin, Lin & Chu t*	-16.8	0	20	699
Null: Unit root (assumes individual unit root process)					Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-16.20	0	20	666	Im, Pesaran and Shin W-stat	-16.3	0	20	699
ADF - Fisher Chi-square	312.94	0	20	666	ADF - Fisher Chi-square	301.3	0	20	699
PP - Fisher Chi-square	359.62	0	20	681	PP - Fisher Chi-square	305.7	0	20	702
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.					** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.				

According to Sim (1980), if a variable not only act as an explanatory variable for a given dependent variable but it also explained by other variables, then all the variables should be treated the same way. Therefore there should be no classification whether a variable should be exogenous or endogenous. All these variables should be treated endogenous. One of the advantages of VAR model is that it allows testing for direction of causality. In order to proceed with VAR testing on these 20 countries, we decided to use unrestricted equation with lag variables based on panel method either lagged Fixed Effect Model (FEM) and/or Random effects model (REM). Restrictions would be imposed and the model re-estimated to obtain the restricted Residual Sum of Square (RSS). F-test would then being applied to determine the short term Granger causality.

First, in order to determine the suitable model for the equation, we apply Hausman test, which is a Chi-square test. If the hypothesis is rejected, then we will use FEM estimation. Our method of estimation is similar to Hansen and Rand (2006) and Chowdhury and Mavrotas (2006). Dummy variables are also being tested on certain years where economic events may have significant impact towards these countries' economies, for e.g. 1973 due to world oil shortage, 1981 global recession and declined in commodity prices, 1998 East Asia economic meltdown and 2001 recession. The VAR can be illustrated by the following matrix in Equation 5.14, which composed of two equations with  $Lgdp\_cap$ , i.e. log GDP per capita, as endogenous variable in the first and  $Crd$ , i.e. credit to private sector as endogenous variable in the second row of the matrix.

$$\begin{pmatrix} Lgdp\_cap_t \\ Crd\_prv_t \end{pmatrix} = \begin{pmatrix} \beta_{10} \\ \beta_{20} \end{pmatrix} + \begin{pmatrix} \beta_{11} & \alpha_{11} \\ \alpha_{21} & \beta_{21} \end{pmatrix} \begin{pmatrix} Lgdp\_cap_{t-1} \\ Crd\_prv_{t-1} \end{pmatrix} + \begin{pmatrix} \beta_{12} & \alpha_{12} \\ \alpha_{22} & \beta_{22} \end{pmatrix} \begin{pmatrix} Lgdp\_cap_{t-2} \\ Crd\_prv_{t-2} \end{pmatrix} + \\ + \begin{pmatrix} \beta_{13} \\ \beta_{23} \end{pmatrix} (Y1973) + \begin{pmatrix} \beta_{14} \\ \beta_{24} \end{pmatrix} (Y1981) + \begin{pmatrix} \beta_{15} \\ \beta_{25} \end{pmatrix} (Y1998) + \begin{pmatrix} \beta_{16} \\ \beta_{26} \end{pmatrix} (Y2001) + \begin{pmatrix} u_{1t} \\ u_{2t} \end{pmatrix}$$

**Equation 5.14**

**FIGURE 5.2**

Correlated Random Effects - Hausman Test				
Test cross-section random effects				
Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		5.360	1	0.021
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
_3D_CRD	0.000	0.000	0	0.021
Cross-section random effects test equation:				
Dependent Variable: _2DIF_LGDPCAP				
Method: Panel Least Squares				
Date: 03/05/10 Time: 22:16				
Sample: 1 760				
Periods included: 37				
Cross-sections included: 20				
Total panel (unbalanced) observations: 702				
	Coefficient	Std. Error	t-Statistic	Prob.
C	0.024	0.001611	15.16114	0
_3D_CRD	-1.09E-05	0.000192	-0.056778	0.9547
Effects Specification				
R-squared	0.115	Mean dependent var	0.024418	
Adjusted R-squared	0.089	S.D. dependent var	0.044491	
S.E. of regression	0.042	Akaike info criterion	-3.4511	
Sum squared resid	1.228	Schwarz criterion	-3.31487	
Log likelihood	1,232.34	Hannan-Quinn criter.	-3.39844	
F-statistic	4.435	Durbin-Watson stat	1.496637	
Prob(F-statistic)	0			

Hausman test indicate to reject null hypothesis at 5 percent. Result shows to use Fixed Effect Indicator



The result from the Hausman test suggest using fixed effect model for the first equation as it was rejected at five percent significance level indicated in [Figure 5.2](#).

Random effects model will be applied for the second equation as the Hausman test result does not reject at five percent significance level in [Figure 5.3](#). Based on SIC and Hanan-Quinn Information Criterion (HIC) automatic selection to determine the number of lags, lag of two was chosen to ensure Gaussian error term to avoid autocorrelation and heteroskedasticity in the data.

In order to test for Granger causality on both equations, we would use the block exogeneity test by applying F-test restrictions on the exogenous lag variable , i.e. lag 1 and 2 of credit to private sector variable , equals to zero. In first equation in Equation 5.14 using fixed models with lags, restrictions was imposed on credit to private sector lag variables . The result shows that the null hypothesis, i.e. credit to private sector does not Granger cause GDP per capita income, was not rejected as indicated in [Figure 5.4](#). It can thus be concluded that credit to private sector does not Granger cause GDP per capita income. The result also shows the dummy variable for 1998 and 2001 shows significance, i.e. indicating that the year 1998 and 2001 has significant impact on GDP per capita of the emerging economies.

The second equation of Equation 5.14, using random effect model with lags of 2, restriction was applied to log GDP per capita income variable. As indicated in [Figure 5.4](#), the F-test result produces critical value of 7.6 or within one percent level of significance. Therefore, the null hypothesis that log GDP per capita do not Granger cause credit to private sector was rejected. In conclusion, the result indicates that there is Granger causality from GDP per capita income to credit to private sector variable. The dummy variable for 1981 shows significance which indicates that the year 1981 have major impact on the level of financial development in these emerging economies.

**FIGURE 5.3**

Correlated Random Effects - Hausman Test				
Test cross-section random effects				
Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		2.269499	1	0.1319
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
_2DIF_LGDPCAP	-0.433	3.468156	6.706402	0.1319
Cross-section random effects test equation:				
Dependent Variable: _3D_CRD				
Method: Panel Least Squares				
Date: 03/05/10 Time: 22:11				
Sample: 1 760				
Periods included: 37				
Cross-sections included: 20				
Total panel (unbalanced) observations: 702				
	Coefficient	Std. Error	t-Statistic	Prob.
C	0.878	0.36943	2.376641	0.0177
_2DIF_LGDPCAP	-0.433	7.628733	-0.056778	0.9547
Effects Specification				
R-squared	0.015	Mean dependent var		0.867425
Adjusted R-squared	-0.014	S.D. dependent var		8.395369
S.E. of regression	8.453	Akaike info criterion		7.136315
Sum squared resid	48,656.56	Schwarz criterion		7.272543
Log likelihood	-2,483.85	Hannan-Quinn criter.		7.188968
F-statistic	0.526	Durbin-Watson stat		1.913587
Prob(F-statistic)	0.957			

Hausman test indicate do not reject null hypothesis at 5 percent.  
Result shows to use Random Effect Indicator

**FIGURE 5.4**

Panel Data Granger causality test 1970-2007											
Model	Vector autoregressions: use the fir-difference series of panel data										Causality
											Direction
	Dep	Constant	dLgdpcap(-1)	dLgdpcap(-2)	Dcrd_prv(-1)	Dcrd_prv(-2)	D1973	D1981	D1998	D2001	Test
	var	(b1)	(b2)	(b3)	(b4)	(b5)	(b6)	(b7)	(b8)	(b9)	<i>Ho F-test</i>
1. FEM *	dLgdpcap	0.02 (0.00)	0.22 (0.00)	0.04 (0.28)	-0.00 (0.63)	-0.00 (0.48)	0.01 (0.28)	-0.01 (0.16)	-0.04 (0.00)	-0.02 (0.00)	<b>0.38 (0.68)</b>
2. REM **	dcrd_prv	0.33 (0.37)	25.55 (0.00)	2 (0.78)	0.12 (0.00)	-0.15*(0)	-0.91 (0.62)	3.03 (0.09)	-1.72 (0.33)	-0.54 (0.76)	<b>7.6 (0.00)</b>
Hausman has been used to determine the type panel model to be used.											
* In equation 1, the null for F-test is b(4)=b(5)=0.											
** In Equation 2, the null for F- test is b(2)=b(3)=0											

The VAR result indicates a one way Granger causality effect in the short term. The countries level of financial development does not Granger cause the level of per capita income, however, level of per capita income does Granger cause financial development.

### 5.3.2 Long Run Causality: Cointegration and ECM

#### 5.3.2.1 Unit Root Test

The first step leading to cointegration is to identify the order of integration of the variables involved. It is important that the variables are of the same order of integration to ensure that the test for cointegration can be clearly established without being too complicated. If the variables are to be found  $I(0)$ , then the VAR model is sufficient to establish long-term association. Several types of unit root tests are being used as discussed in the previous section, e.g. Levin, Lin and Chu; Im, Pesaran and Shin; Augmented Dickey Fuller based on Fischer Chi-Square ;and Phillip Perron based on Fischer Chi-Square. The results presented in Figures 5.5a and 5.5b below indicate that Credit to Private Sector variable and GDP per Capita Income are not stationary or  $I(0)$  using Schwarz (SIC) and Akaike (AIC) Information Criterion. However, for GDP per capita Income variable, only Levin, Lin & Chu test indicates that credit to private sector variable is  $I(0)$ , even though three other test shows this variable is  $I(1)$ .

After both variables were subjected to differencing, the variables were then transformed into stationary variable. Based on the previous unit root test, it took 4 and 2 lags based on Schwartz Information Criteria (SIC) procedure to transform Credit to Privates Sector and Log GDP per Capita Income variables, respectively, into stationary variables. (Refer to [Figure 5.1](#)).

**FIGURE 5.5a**

Panel unit root test: Summary

Series: \_2LGDP\_CAP

Date: 02/22/10 Time: 12:38

Sample: 1 760

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic selection of lags based on SIC: 0 to 1

Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.62451	0.0043	20	715
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	1.47349	0.9297	20	715
ADF - Fisher Chi-square	39.6185	0.4873	20	715
PP - Fisher Chi-square	39.91	0.4743	20	722

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

**FIGURE 5.5b**

Panel unit root test: Summary

Series: \_3CRD\_PRV

Date: 02/26/10 Time: 00:07

Sample: 1 760

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic selection of lags based on SIC: 0 to 5

Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-0.80438	0.21	20	681
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.70791	0.24	20	681
ADF - Fisher Chi-square	55.9799	0.05	20	681
PP - Fisher Chi-square	38.0396	0.56	20	705

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

As both variables are determined to have the same order of integration, we proceed with the first test of cointegration to determine whether there is long term association between these variables.

**FIGURE 5.6**

**Pedroni Residual Cointegration Test**

Series: \_2LGDP\_CAP\_3CRD\_PRV

Date: 02/22/10 Time: 13:37

Sample: 1 760

Included observations: 760

Cross-sections included: 20

Null Hypothesis: No cointegration

Trend assumption: Deterministic intercept and trend

Lag selection: Automatic SIC with max lag of 5 to 8

Newey-West bandwidth selection with Bartlett kernel

Alternative hypothesis: common AR coeffs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	11.29847	0	8.669783	0
Panel rho-Statistic	1.755875	0.09	2.262432	0.0309
Panel PP-Statistic	-2.51667	0.02	-0.40223	0.3679
Panel ADF-Statistic	-2.56529	0.01	-1.15552	0.2046

Alternative hypothesis: individual AR coeffs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	3.126555	0.00
Group PP-Statistic	-0.56379	0.34
Group ADF-Statistic	-2.29358	0.03

### 5.3.2.2 Pedroni Cointegration

The first cointegration test is to use the Pedroni method. The result of Pedroni Eagle-Granger test of cointegration is shown in [Figure 5.6](#). The Pedroni cointegration test shows that both variables are cointegrated after the intercept and deterministic trend terms are included in the model. The first four statistics or the pooling within dimension shows both

variables are cointegrated as the probability shows significance at least at 10 percent level. In fact, three or four within statistic, i.e. V-statistic, Phillip Perron and ADF statistic shows significance at lesser than five percent.

On the other hand, the Group or pooling along the between-dimension estimator shows that 2 out of 3 tests, i.e. rho and ADF statistic, show level of significance at five percent.

Therefore, it can be concluded that both variables, financial development and GDP income per capita, are cointegrated. However, to confirm the result we proceed for the second test by using the Johansen cointegration which involves several measures.

#### 5.3.2.3 Johansen Cointegration and Error Correction Method (ECM)

The next step after determining the unit root is choosing the optimal lag length of both variables before undertaking the cointegration test. The most common way of testing the optimal length is to estimate using VAR model at the level form. VAR model is run first starting with several lags and then being reduced down (Harris, 1995). At each lag, Schwarz Information Criterion (SIC) and Hanan-Quinn (HIC) values are checked to determine the optimal lag based on the lowest SIC and HIC value. The VAR test also included a few dummy variables to account for significant shift in the economic events such as 1981 world recession, 1998 Asian economic crisis, and 2001 world economic downturn. The results in [Figure 5.6a](#) below indicates that the lowest HQ and SIC is when VAR is at lag 2 Therefore, the lag 2 is used to test the cointegration and restrictions using ECM.

It is also important to find the appropriate lag length in order to achieve a Gaussian error term, i.e. standard error terms that do not have autocorrelation, heteroskedasticity and non-normality. Autocorrelation using LM test does not reject the null hypothesis of no autocorrelation at lag 2. White heteroskedasticity test does not reject of null hypothesis of

homoskedasticity in the equation . The normality test shows that the residual are multivariate normal at lag length 2.

FIGURE 5.6a		Lag determination for Cointegration Test			
Endogenous variables: _2LGDP_CAP _3CRD_PRV					
Exogenous variables: C Y1981 Y1998 Y2001					
Date: 03/09/10 Time: 00:48					
Sample: 1 760					
Included observations: 494					
Lag	LogL	SC	HQ		
0	-3,167.81	12.93	12.88		
1	-862.62	3.64	3.58		
2	-813.75	3.50*	3.42*		
3	-810.58	3.53	3.43		
4	-799.25	3.54	3.41		
5	-798.27	3.58	3.44		
6	-795.48	3.62	3.46		
7	-793.36	3.66	3.48		
8	-789.76	3.70	3.49		
9	-787.79	3.74	3.51		
10	-786.47	3.79	3.54		
* indicates lag order selected by the criterion					
SC: Schwarz information criterion					
HQ: Hannan-Quinn information criterion					

The next step is choosing the appropriate model, whether intercept and/or a trend should enter the short run or the long run model or both models. The model using the VECM can be used to include various options (Harris, 1995).

$$\Delta Z_t = \Gamma_1 \Delta Z_{t-1} + \dots + \Gamma_{k-1} \Delta Z_{t-k} + \alpha \begin{pmatrix} \beta \\ \mu_1 \\ \delta_1 \end{pmatrix} (Z_{t-1} \ 1 \ t) + \mu_2 + \delta_2 t + u_t$$

**Equation 5.15**



The above model includes  $\mu_1$  as the constant and  $\delta_1$  as the trend in the long run model or the cointegrating (CE) term. Also, intercept  $\mu_2$  and the trend  $\delta_2$  are included in the short run model (the VAR model).

The above set-up suggests that there can be 5 types of cointegrating models. The first model is when there is not intercept or deterministic trend in either CE or VAR ( $\delta_1 = \delta_2 = \mu_1 = \mu_2 = 0$ ). The second model is when there is not intercept or trend in VAR, however, there is intercept but no trend in CE ( $\delta_1 = \delta_2 = 0$ ). The intercept is only applied for the long run on cointegration equation which would affect the unit of measurement of the following variables ( $Z_{t-1} \ 1 \ t$ ). The third model is when there is intercept in CE and VAR, but no trends in CE or VAR ( $\delta_1 = \delta_2 = 0$ ). In this model, intercept in CE is effectively cancelled out by the intercept in the VAR, leaving just one intercept in the model. The fourth model is when there is intercept in CE and VAR, linear trend in CE but no trend in VAR ( $\delta_2 = 0$ ). The fifth model is the unrestricted one as above when there is intercept and quadratic trend in the CE as well as intercept and linear trend in VAR.

According to Johansen (Harris, 1995), the first and the fifth models are unlikely to happen and impossible to explain in economic theory. The first model where ( $\delta_1 = \delta_2 = \mu_1 = \mu_2 = 0$ ) is considered too restrictive as at least one constant needs to be included in  $\beta$ . The fifth model to test the quadratic trend data in the model is infrequently used as it only occurs very rarely.

The Pantula principle revolves around estimating three models, i.e. options 2, 3 and 4 from the above, going from the most restrictive hypothesis through to the least restrictive hypothesis, i.e. when  $r=1$  and model 2 to the least restrictive model or hypothesis when  $r=n-1$  and model 4. It involves moving from the most restrictive model while at each stage comparing the trace test statistic to determine its critical value. It only stops when we reached for the first time that the null hypothesis of no cointegration is not rejected. According to the results shown in [Figure 5.7](#)

for lag two, we would move to the right until we stop at model 2 when trace test shows that  $r=2$  and the null hypothesis of no cointegration is first not rejected (Refer to [Figure 5.7](#)). Therefore, Model 2 of the cointegration is selected.

Figure 5.7									
Pantula test results-Using Trace Values					Pantula test results-Using Maximum Eigen Value				
rank	n-r	model 2	model 3	model 4	rank	n-r	model 2	model 3	model 4
0	2	126	80	62	0	2	123	69	52
1	1	43*	58	36	1	1	43*	58	36

n = number of variables

\* Indicates the first time that the null cannot be rejected

Since there are only two variables, the most number of cointegration for nonstationary variables to register is one. Suppose that  $r=1$  and  $z_t=[y_{1t}, y_{2t}]$ ; then  $\alpha=[\alpha_{11}, \alpha_{21}]$ . The first variable indicate the speed at which  $\Delta y_{1t}$ , adjust towards the single long-run cointegration relationships ( $\beta_{11}y_{1t-1} + \beta_{21}y_{2t-1}$ ), while  $\alpha_{21}$  represents the speed at which  $\Delta y_{2t}$  response to the disequilibrium changes represented by the cointegration vector. The Johansen estimation procedure is a maximum likelihood approach in which all the unknown parameters in these two equations are estimated simultaneously.

The next stage is to test for weak exogeneity by imposing restrictions on the Vector Error Correction Model (VECM). A test of zero restrictions on  $\alpha$  is the test of weak exogeneity. A variable is considered weakly exogenous if it is only a function of lagged variables and the parameter of the equation generating Z are independent of the parameters generating the other variables on the system (Johansen and Jeselius, 1992). We can use either  $\alpha$  or  $\beta$  as the restrictions. The  $\alpha$  coefficient is the error correction or the short term adjustment that reverts back to its former state of equilibrium. If we place restrictions by normalizing  $\alpha$  to zero, all the  $\beta$  coefficients (long run parameters) in the same row would also be zero. Since there are

only 2 variables, there are only two error correction variables, i.e.  $\alpha_{11}$  and  $\alpha_{21}$ . The system can be shown as below

$$\begin{pmatrix} \Delta Lgdp_{cap_t} \\ \Delta Crd_{prv_t} \end{pmatrix} = \begin{pmatrix} \alpha_{11} \\ \alpha_{21} \end{pmatrix} \begin{pmatrix} \beta_{11} & \beta_{21} \\ \beta_{12} & \beta_{22} \end{pmatrix} \begin{pmatrix} Lgdp_{cap_{t-1}} \\ Crd_{prv_{t-1}} \end{pmatrix} + \begin{pmatrix} c_{11} & c_{12} & c_{13} & c_{14} \\ c_{21} & c_{22} & c_{23} & c_{24} \end{pmatrix} \begin{pmatrix} Lgdp_{cap_{t-1}} \\ Crd_{prv_{t-1}} \\ Lgdp_{cap_{t-2}} \\ Crd_{prv_{t-2}} \end{pmatrix} + \mu_t$$

**Equation 5.16**

Log GDP per capita and Credit to Private Sectors are the endogenous variables in the above VECM model.

Granger representation theorem implies that at least one of the adjustment coefficient  $\alpha_{11}$  or  $\alpha_{21}$  must be non-zero if a long run relationship between the variable have to hold (Engel and Granger, 1987). If the first row of the  $\alpha$  matrix were all zeros then the  $\beta$ s would drop out of the Y equation and then it would be weakly exogenous. Therefore, by normalizing  $\alpha$  in same row equals to zero would test the weak exogeneity of the corresponding variable. If the variable found to be weakly exogenous then the endogenous part of the variable can cancel out.

The first step to examine which of the two variables is weakly exogenous is by normalizing the error correction for the first equation, i.e.  $\alpha_{11}=0$  (refer to [Figure 5.8](#)) or using chi square test (Johansen, 1995). The result from the restriction on the short run error correction,  $\alpha_{11}=0$ , is chi square at 58.11 or p value close to zero. This shows that the null hypothesis is rejected, i.e. per capita income variable is not considered weakly exogenous. A variable is not considered a weakly exogenous variable if it can explain not only by its own lag variable, but by other parameters on the RHS of the equation (Kennedy, 2008).

We also compared using the other ratios in the restricted equation 1 ([Figure 5.8](#)), with unrestricted equation 1 in ([Figure 5.9](#)). According to Wooldridge (2008), the adjusted  $R^2$  for

the restricted version is lower than the unrestricted version. The equation 1 in [Figure 5.8](#) recorded adjusted  $R^2$  at 0.051, which is lower than 0.127, which is found in the unrestricted equation 1 in [Figure 5.9](#). Hence, the sum of squared residuals of the restricted equation would be higher than the unrestricted *ceteris paribus*. This is also implied when we compare the sum of square residuals for equation 1, i.e. the restricted equation ([Figure 5.8](#)), which 1.20 is marginally higher than 1.105 shown in the unrestricted equation 1 ([Figure 5.9](#)). The F-statistic for equation 1 ([Figure 5.9](#)) show the F-test as 9.868 after imposing restriction of one, i.e.  $\alpha_{11}=0$ , with number of observation of 655. Since the highest critical value of F-test with one restriction with infinity number of observations at 1 percent significant is only 6.63, we conclude that the F-test is significant at 1 percent since ( $9.868 > 6.63$ ). Therefore, we cannot exclude the impact of short-run coefficient,  $\alpha_{11}=0$ , in affecting GDP per capita growth.

The second test of error correction model is when we impose restriction to the equation 2, i.e. by imposing error correction or  $\alpha_{21}=0$  (Equation 5.16). The result is chi square of 0.29 with p value =0.59 ([Figure 5.9](#)), which means that the null hypothesis is not rejected. We, therefore, conclude that credit to private sector variable is weakly exogenous. Since short run coefficient ( $\alpha_{21}$ ) becomes zero, it would then zero out the long run coefficients ( $\beta$ s) and all of them would be dropped from the equation. If the variable is weakly exogenous, then the endogenous part can be dropped from the system and so is the equation. However, when F-test is performed on the restricted equation 2,  $\alpha_{21}$  is 10.505 which is above 6.63. This shows that the error correction or short run adjustment have significant impact at 1 percent level. According to Grigorian et al (2004) a variable is considered a weakly exogenous if it does not react to long run equilibrium, however, may still react to changes in

**FIGURE 5.8**

## Vector Error Correction Estimates

Date: 03/13/10 Time: 02:18

Sample: 1 760

Included observations: 655

Standard errors in ( ) &amp; t-statistics in [ ]

Cointegration Restrictions:

**A(1,1)=0**

Convergence achieved after 4 iterations.

Not all cointegrating vectors are identified

LR test for binding restrictions (rank = 1):

Chi-square(1) 58.11811

Probability 0

Cointegrating Eq: CointEq1

\_2LGDP\_CAP(-1) 0.294

\_3CRD\_PRV(-1) -0.060

C 2.248

Error Correction: D(\_2LGDP\_CAP) D(\_3CRD\_PRV)

CointEq1 0 0.318

0 -0.127

[ NA] [ 2.51502]

D(\_2LGDP\_CAP(-1)) 0.359 25.139

-0.038 -6.799

[ 9.41405] [ 3.69725]

D(\_2LGDP\_CAP(-2)) 0.179 2.211

-0.038 -6.835

[ 4.66449] [ 0.32350]

D(\_3CRD\_PRV(-1)) 0.000 0.124

0.000 -0.036

[ 0.00163] [ 3.46116]

D(\_3CRD\_PRV(-2)) 0.000 -0.136

0.000 -0.035

[ 0.75085] [-3.85081]

R-squared 0.057 0.068

Adj. R-squared 0.051 0.062

Sum sq. resids 1.200 38,259.450

S.E. equation 0.043 7.672

F-statistic 9.868 11.865

Log likelihood 1,134.494 -2,261.514

Akaike AIC -3.449 6.921

Schwarz SC -3.415 6.955

Mean dependent 0.024 0.961

S.D. dependent 0.044 7.923

Determinant resid covariance (dof adj.) 0.108

Determinant resid covariance 0.107

Log likelihood -1,130.237

**FIGURE 5.9**

Vector Error Correction Estimates

Date: 03/13/10 Time: 02:20

Sample: 1 760

Included observations: 655

Standard errors in ( ) &amp; t-statistics in [ ]

Cointegration Restrictions:

**A(2,1)=0**

Convergence achieved after 2 iterations.

Not all cointegrating vectors are identified

LR test for binding restrictions (rank = 1):

Chi-square(1) 0.29

Probability 0.59

Cointegrating Eq: CointEq1

\_2LGDP\_CAP(-1) -0.336

\_3CRD\_PRV(-1) 0.006

C 3.481

Error Correction: ( \_2LGDP\_CAP) D( \_3CRD\_PRV)

CointEq1 0.013 0

-0.002 0

[ 8.17563] [ NA]

D( \_2LGDP\_CAP(-1)) 0.279 26.341

-0.038 -7.106

[ 7.33626] [ 3.70701]

D( \_2LGDP\_CAP(-2)) 0.105 3.284

-0.038 -7.104

[ 2.75196] [ 0.46235]

D( \_3CRD\_PRV(-1)) 0.000 0.115

0.000 -0.036

[-0.68965] [ 3.22039]

D( \_3CRD\_PRV(-2)) 0.000 -0.145

0.000 -0.035

[-0.40090] [-4.09913]

R-squared 0.132 0.061

Adj. R-squared 0.127 0.055

Sum sq. resids 1.105 38,560.210

S.E. equation 0.041 7.702

F-statistic 24.774 10.505

Log likelihood 1,161.656 -2,264.079

Akaike AIC -3.532 6.928

Schwarz SC -3.498 6.963

Mean dependent 0.024 0.961

S.D. dependent 0.044 7.923

Determinant resid covariance (dof adj) 0.100

Determinant resid covariance 0.099

Log likelihood -1,101.321

Akaike information criterion 3.403

Schwarz criterion 3.492

the same variables in the short run basis. Hence, even though the equation 2 and credit development variable is considered weakly exogenous and there is no long run effect ( $\beta's=0$ ), there still exist temporary short run impact from  $\alpha_{21}$ .

From these two results of the weak exogeneity test, we can conclude that there exists only one cointegration vector. Since equation 2 in equation 5.16, i.e. credit development as a endogenous variable is dropped off due to weak exogeneity, it leaves only one equation and cointegration, i.e. equation 1. Based on equation 1, there exists long run causality running from credit to private sector variable towards log GDP per capita income. In another words, financial development has long run causality impact on income (GDP) growth in these countries. However, based on F-test calculation, there is bidirectional short term causality between credit to private sector with log GDP per capita and therefore, we can conclude that there is bidirectional effect between financial development and income growth.

## **5.4 CONCLUSION**

This chapter has tested the short and long run causality effect between financial development and income (GDP) growth using vector autoregression (VAR) and vector error correction (VECM) method. Attention is focused on two specific variables, GDP per capita and credit to private sector as a proxy for economic growth and financial development. Using the F-test on VAR model, the results show Granger causality from GDP growth to financial development in the short term. However, based on the F-test result of Johansen VEC model, it shows a bi-directional effect between financial development and growth in the short term. Hence, both models resulted in different F-test outcome for short term causality effect. However, since both results indicate the importance of growth towards financial development in the short term, it is vital for the economy to generate enough growth in order to spur financial development.

In the long-term, by applying a weak exogeneity test on the Johansen VECM model, the result indeed shows that there is clear long term causality effect from financial development to growth. In long term it is imperative that these emerging economies rely on developing their financial sectors by allowing the establishment of more financial institutions and offering more and better services that would engender greater financial transactions in the economy, which would translate into long term and sustainable growth. With the increased depth and efficiency of the financial intermediaries, the funds would be effectively channeled to the needed households for loans and private sectors to fund their investments, yielding higher growth.



## **CHAPTER 6**

### **PRIVATE SAVINGS AND NON-MARKET INSTITUTIONAL FACTORS**

#### **6.1 INTRODUCTION**

There is a widespread belief among economists that the quality of institutions is very important for the economic growth of the countries (Hall and Jones (1999), Acemoglu et al (2001); Rodrik et al (2002); Easterly and Levine (2002)). Countries, whose investors feel secured to uphold property rights and respect the rule of law, would be able to establish a better and stronger economy. Similarly, poor countries that are able to embark on institutional reforms by strengthening property rights and enforcing the rule of law are able to enhance their economic productivity.

While institutions have emerged as a key determinant of economic growth, there is the key question of what defines the quality of institutions. North (1990) defines institutions more generally as rules of the game, the enforcement characteristics of rules, and norms of behaviour that structure repeated human interactions.

Rodrik (2000) defines institutions as public organizations or non-market institutions that serve to protect property rights and rule of law in the country. A market economy relies on a wide array of non-market institutions that perform regulatory, stabilizing, and legitimizing functions. Rodrik (2004) argues that sound non-market institutions are present when there exist security of property rights, the rule of law prevails, private incentives are aligned with social objectives, monetary and fiscal policies are grounded in solid microeconomic institutions, and citizens have the recourse to civil liberties and political representation.

Dixit (2004) has termed non-market institutions as formal institutions, which are institutions under government jurisdiction that protect property rights, responsible for the

legislation, policing and judiciary matters. These formal institutions rely on formal contracts and enforcement by the courts, or the police to ensure the property rights are respected and upheld.

For this study, following Rodrik (2000) and Dixit (2004), we refer to non-market institutions as third party institutions, i.e. the institutions under the jurisdiction of municipality, state, or federal government that are able to maintain the security of property rights, governing, regulating, maintaining stability, and enforcing the rule of law. In our empirical study, using the International Country Risk Guide (ICRG) database, we have identified several institutional factors to proxy for the non-market institutions, i.e. levels of corruption, bureaucracy efficiency, law and order, accountability and political stability.

## **6.2 METHODOLOGY AND DATA DESCRIPTION**

### **6.2.1 Data Description**

The exogenous variables used are the demographic and macroeconomic variables from the previous chapter 4. In addition, a new variable of financial openness measure based on the four main categories of openness used by Chin and Ito (2008) is introduced beside the current trade openness variable obtained from the Penn World database.

The estimated equation is to examine the impact of the institutional factors on private savings. Demographic and macroeconomic factors are used as controlling factors. Institutional variables, such as corruption, law and order, bureaucracy, government stability and accountability are used in the equation and these variables are obtained from International Country Risk Guide (ICRG) database generated by the PRS group. The data collected for the demographic, macroeconomic and institutional are from 1984 until 2006. .

The specification for the model can be framed as follows:

$S\_GDP07 = F(GDPcap\_gth, lgdp\_cons, old\_dep, yth\_dep, open, remit, urb\_gth, crd\_prv, stk\_trn, open, kaopen, corr, law\_ord, bureau, stability, accountability)$  where

- i.  $S\_GDP07$  refers to the savings of household and corporate sector over GDP. The data is taken from Penn World Database.
- ii.  $Lgdp\_cons$  is for log of real GDP per capita, denominated in US dollar based on 2000 constant prices. GDP per capita is gross domestic product divided by midyear population. The source is from World Development Indicators (WDI).
- iii.  $Gdpcap\_gth$  is the annual percentage growth rate of GDP per capita is based on constant local currency.
- iv.  $Old\_dep$  and  $Yth\_dep$  refer to the old and young dependency over the total population and the variable is extracted from WDI.
- v.  $Open$  or Trade Openness is the ratio of total trade divided by the GDP and it measures the trade openness of a country. The data is taken Penn World database.

$Kaopen$  or financial openness variable is an index formulated by Chinn and Ito (2008) from IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The higher the index, the more open is the country for capital transaction across borders. The data is based on four major categories mainly:

- a. variable indicating the presence of multiple exchange rates ( $k1$ );
  - b. variable indicating restrictions on current account transactions( $k2$ );
  - c. variable indicating restrictions on capital account transactions ( $k3$ ); and
  - d. variable indicating the requirement of the surrender of export proceeds ( $k4$ ).
- vi.  $Urb\_gth$  is the share of urban population over total population and obtained from WDI.
  - vii.  $Crd\_Prv$  is the domestic credit to private sector as a percentage of GDP and derived from WDI. It is used to measure the extent of financial deepening in the financial institutions.

- viii. STVALTRADED is defined as stock value traded over stock market. It is used as a proxy to measure the extent of the development of equity or share market in these countries. Since stock prices appear in both denominator and numerator, the erratic fluctuation would neutralise each other, therefore the measurement would remain rather steady and less susceptible to measurement error. The increase in value of share market would indicate also the increase in value of equity held by the private sectors. The increase in general wealth meant that certain fractions would be allocated for savings. The data is from WDI.

Indicators from ICRG database are used as proxies to measure the extent of institutional developments in these countries. Each category has its own range of scale, however, all of them have been normalised to a scale between 0 and 1.

- I. Corr or corruption is a measure of the perception of corruption in the political system. Corruption has major impact on the foreign investment and business activities on the affected countries. The business activities encompass activities such as i) excessive patronage, ii) nepotism and cronyism in awarding contract, , and iii) suspicious ties between politicians and businessmen. The source is from ICRG with scale ranges from 0 to 6, however, has been normalised to the scale of 0 to 1.
- II. Law\_ord or Law and Order variable refers to 2 separate subcomponents that is law and order. Each subcomponent is measured from 0 to 3 scales with both totals to 6 points. Law refers to the fairness of the judicial system while order refers to the adherence to the law.
- III. Bureau refers to bureaucracy with original scale runs from 0 to 4. Higher points are given to the government administration that can operate independently detached from the political pressure and transparent in running the government. Lesser points are given to countries with questionable process of running government and lack of transparency. The actual scale ranges from 0 to 4.

- IV. Acct\_ty or democratic accountability refers to how responsive is the government towards the people's needs. A government which is autocratic and unresponsive towards the people's social needs will receive the least point. The original score ranges from 0 to 6 points.
- V. Stability or political stability measures the government capability in executing promised programmes and their ability to remain in power. There are 3 subcomponents in the assessments: government unity, legislative strength and popular support. Higher scores relates to more stable government.

### 6.2.2 Methodology

There are 20 developing countries that are being examined in this study. Since it involves cross countries studies, panel estimation is used to test the impact of institutional factors. Panel estimation is also used as it can reduce the omitted variable bias and time-invariant heterogeneity (Asteriou and Hall, 2007). Panel data can be used to deal with heterogeneity in the individual units. In any cross-sections analysis, there are numerous unmeasured explanatory variables, e.g. firms, countries etc, that affected the individual units being analysed. Heterogeneity meant that these individual units are all different from one another. Omitting these variables causes biasness in estimation. Panel estimation method enables to correct the biasness problem.

However, it is important firstly to determine the types of panel estimation to be used, either common pool method or heterogeneous panel estimations. In order to determine the preferred and appropriate estimation method, i.e. either pool or panel estimation, a redundant fixed effect testing is applied to determine whether the intercept are homogenous, or heterogeneous among invariant time characteristic across the sample countries. Figure 6.1 (*refer to next page*) shows

DETERMINING POOL OR PANEL DATA				
FIGURE 6.1				
Redundant Fixed Effects Tests				
Equation: Untitled				
Test cross-section fixed effects				
Effects Test		Statistic	d.f.	Prob.
Cross-section F		43.955	-17,236.000	0.000
Cross-section Chi-square		378.160	17.000	0.000
Cross-section fixed effects test equation:				
Dependent Variable: _1S_GDP				
Method: Panel Least Squares				
Date: 02/06/10 Time: 00:46				
Sample: 1 480				
Periods included: 24				
Cross-sections included: 18				
Total panel (unbalanced) observations: 265				
	Coefficient	Std. Error	t-Statistic	Prob.
C	2.962	8.214	0.361	0.719
_2GDPCAP_GTH	0.422	0.113	3.735	0.000
_2LGDP_CAP	4.773	0.716	6.666	0.000
_2YTH_DEP	-0.975	0.129	-7.555	0.000
_2OLD_DEP	-0.575	0.371	-1.551	0.122
_3CRD_PRV	0.005	0.012	0.430	0.667
_3STVALTRADED	3.503	0.828	4.231	0.000
_3LR_DEPINT	0.247	0.328	0.752	0.453
_4L_INF	0.309	0.344	0.900	0.369
_4UBN_GTH	3.169	0.432	7.334	0.000
_5OPEN07	0.046	0.009	5.209	0.000
_5KAOPENESS	1.053	0.343	3.067	0.002
R-squared	0.773	Mean dependent var		24.789
Adjusted R-squared	0.764	S.D. dependent var		13.168
S.E. of regression	6.403	Akaike info criterion		6.596
Sum squared resid	10,372.160	Schwarz criterion		6.758
Log likelihood	-861.916	Hannan-Quinn criter.		6.661
F-statistic	78.514	Durbin-Watson stat		0.219
Prob(F-statistic)	0.000			

that the F-test is 43.9 and significant, therefore, we reject the null hypothesis of no fixed effect differences between these countries. It shows that the intercepts are heterogeneous and therefore, panel estimation, instead of pooled estimation method should be used. Therefore if there is an increase in an exogenous variable in a given country, the effect over time would not be quantitatively the same across different countries. There are two types of panel data models to choose, either fixed or random effect models. The random effects model assumes that each country differs in its error term, whereas in fixed effect model, each country differences are captured in intercept parameter.

#### 6.2.2.1 Fixed Effect Method

In fixed effect models, the intercepts are allowed to be varied, but the steepness of the slope remains the same. The error terms remain zero with constant variance for the individuals and periods. In another words, all the variations among individuals are captured by the intercept. The intercept is also used to control the individual specific differences. There are two methods to applying the fixed effect model, i.e. by including intercept dummy for each individual, country or firms; or by averaging data across time. By averaging data across time, it involves a within transformation, which essentially involves subtracting the time-mean of each entity from the values of the variables as illustrated below:

Assume a panel data equation as follows:

$$y_{it} = \beta_{it} + \beta_{2it}x_{2it} + \beta_{3it}x_{3it} + e_{it} \quad t=1,2,..T \quad \text{Equation 6-1}$$

Firstly , it involves average the data across time by aggregating the left and right hand side of equation and divided by T (time).

$$\frac{1}{T} \sum_{t=1}^T (y_{it} = \beta_{1i} + \beta_{2it}x_{2it} + \beta_{3it}x_{3it} + e_{it}) \quad \text{Equation 6-2}$$

Since the variable did not vary across time, the equation can be expanded:

$$\bar{y}_i = \frac{1}{T} \sum_{t=1}^T (y_{it} = \beta_{1i} + \beta_2 \frac{1}{T} \sum_{t=1}^T x_{2it} + \beta_3 \frac{1}{T} \sum_{t=1}^T x_{3it} + \frac{1}{T} \sum_{t=1}^T e_{it}) \quad \text{Equation 6-3}$$

And simplified into:  $\bar{y}_t = \bar{\beta}_1 + \beta_2 \bar{x}_{2i} + \beta_3 \bar{x}_{3i} + \bar{e}_i$ , in which “bar” notation  $\bar{y}_t$  indicates the values of  $y_{it}$  has been averaged over time.

**Equation 6-4**

Then we subtract equation 6-4 from 6-1 and will have the following results.

$$y_{it} = \bar{\beta}_{it} + \beta_{2it} x_{2it} + \beta_{3it} x_{3it} + e_{it}$$

$$\text{Minus } \bar{y}_t = \bar{\beta}_1 + \beta_2 \bar{x}_{2i} + \beta_3 \bar{x}_{3i} + \bar{e}_i$$

-----

$$y_{it} - \bar{y}_{it} = \beta_2 (x_{2it} - \bar{x}_{2i}) + \beta_3 (x_{3it} - \bar{x}_{3i}) + (e_{it} - \bar{e}_i)$$

From there the  $\beta_{1i}$  has been cancelled out and if it was to repeat with other individuals, it would be transformed into regression containing demean variables only. The regression does not have any intercept and the dependent variable have zero mean. The above equation can be simplified as below:

$$\tilde{y}_{it} = \beta_2 \tilde{x}_{2it} + \beta_3 \tilde{x}_{3it} + \tilde{e}_{it}$$

The tildes indicates the variables deviates from the means form.

#### 6.2.2.2 Hausman Method

The next step is to determine between the two types of panel estimation, fixed or random, is to be used by applying the Hausman test (Hausman and Taylor, 1981). Hausman test is used to check for any correlation between the error component  $u_i$  and the regressors in a random effects model. The test compares the coefficient estimates from the random effects model to those from



the fixed effects model. By economising on the degrees of freedom, the random effect model produced a more efficient estimator of the slope of coefficient than fixed effect model.

The idea underlying Hausman test is that both the random and fixed effects estimators are consistent if there is no correlation between  $u_i$  and the explanatory variables. If both estimators are consistent, then they should converge to the true parameter values  $B^k$  in large samples. That is, in large samples, the random effects and fixed effects estimates should be identical or similar. On the other hand, if  $u_i$  is correlated with any  $x_{kit}$  the random effects estimator is inconsistent while the fixed effects estimator remains consistent. Thus in large samples, the fixed effects estimator converges to the true parameter values, but the random effects estimator converges to some other value that is not the value of the true parameters. Then we can see the differences between the fixed and random effect estimators.

In another words, the biasness in the random effect is due to the correlation between error term and its intercept. Biasness would not occur in the fixed effect model as the different intercepts are explicitly recognised due to dummies assigned to them. In contrast to the random effect, different intercepts are not explicitly recognised, in which these intercepts are incorporated within the error term. Whenever  $x$  value increases,  $y$  value tend to increase more due to simultaneous increase in the composite or error term. The biasness would become more prominent as the samples grew larger as a result of high correlation between  $x$  value and the error term in random effect.

The Hausman test's null hypothesis is that  $u_i$  is uncorrelated with any of the explanatory variables, i.e. the random effects estimator will have smaller variance than the fixed effects estimator, at least in large sample. Therefore, if there is no correlation between the exogenous and error term, then random effect estimator is more efficient and has lesser margin of standard

error. However, if there is an endogeneity problem, or where there is correlation between the explanatory variables and error term, then the fixed effect model is more appropriate.

### **6.3 CORRELATION**

The cross correlations presented in Table 6.2 below are obtained from the time period of estimation from 1984 until 2006 suggest that there are few variables that are highly correlated that is at 50 percent or over. Private saving is highly correlated with several determinants at one percent significance level: i) GDP per capita growth at 56 percent, ii) youth dependency at minus 64 percent and iii) trade openness at 64 percent. These high correlations meant that per capita growth and trade openness are highly associated with private savings although such association does not imply causation one way or another. In contrast, private savings ratio would also be highly associated but negatively with youth dependency ratio, which is consistent with the Life Cycle Hypothesis.

GDP per capita is also highly correlated with several variables: i) youth dependency at minus 63 percent, ii) urban growth at minus 49 percent, and iii) law and order at 51 percent at significance level of one percent.

Youth dependency and urban growth are highly negative correlated with GDP per capita which is indicative that high GDP per income group is associated with low youth dependency and urban growth population.

Meanwhile, old dependency is highly negatively correlated with young dependency.

Correspondingly, the higher is the share of youth age dependency group, the lower is the old age dependency group. Old dependency is also negatively correlated with urban growth, which signifies the declined of retired population is associated with the increased growth of urban population.

TABLE 6.2 CORRELATION																	
Correlation	S_GDP	GDPCAP_GTH	LGDP_CAP	OLD_DEP	YTH_DEP	CRD_PRV	LR_DEPINT	STVALTRA	LG_INF	UBN_GTH	KAOPEN	OPEN	CORR	LAW_ORD	STABILTY	ACC_TY	BUREU
S_GDP	1																
GDPCAP_GTH	0.32***	1															
LGDP_CAP	0.56***	0.01	1														
OLD_DEP	0.22***	-0.02	0.6***	1													
YTH_DEP	-0.64***	-0.22***	-0.63***	-0.64***	1												
CRD_PRV	0.44***	0.08	0.31***	-0.09	-0.23***	1											
LR_DEPINT	-0.31***	-0.24***	-0.23***	-0.05	0.23***	-0.18***	1										
STVALTRADED	0.46***	0.22***	0.37***	0.1*	-0.46***	0.13**	-0.05	1									
LG_INF	-0.35***	-0.21***	-0.25***	0	0.19***	-0.28***	0.58***	-0.11*	1								
UBN_GTH	0.12**	0.1	-0.49***	-0.6***	0.35p***	0.19***	0.03	-0.12**	-0.06	1							
KAOPENESS	0.33***	0.09	0.14**	0.04	-0.03	0.07	-0.3***	-0.05	-0.47***	0.2***	1						
OPEN	0.63***	0.15**	0.39***	0.04	-0.33***	0.53***	-0.51***	0.05	-0.44***	0.17***	0.44***	1					
CORR	0.24***	-0.02	0.41***	0.22***	-0.18***	0.37***	0.02	-0.05	0.1	-0.21***	-0.11*	0.24***	1				
LAW_ORD	0.45***	0.09	0.51***	0.32***	-0.38***	0.39***	-0.15**	0.19***	-0.33***	-0.15***	0.3***	0.4***	0.38***	1			
STABILTY	0.08	-0.09	0.2***	-0.1	-0.11*	0.24***	-0.23***	0.19***	-0.43***	-0.03	0.23***	0.32***	-0.12**	0.18***	1		
ACC_TY	-0.1	-0.08	0.14**	0.43***	-0.2***	0.03	0	0.08**	0.07	-0.14**	-0.13**	-0.14**	0.26***	0.01	-0.09	1	
BUREU	0.44***	0.07	0.57***	0.35***	-0.48***	0.42***	-0.11*	0.19***	-0.1	-0.24***	-0.08	0.33***	0.57***	0.37***	0.12**	0.14**	1

\*\*\* Significant at 1percent level

\*\* Significant at 5 percent level

\* Significant at 10 percent level

Credit to private sector, which is proxy for financial deepening in financial institutions sector, shows that it is highly associated with trade openness variable at 52 percent level. This indicates that the increased financial deepening is associated with greater trading openness carry out by the countries. Real deposit interest rate, which is part of financial variable, is significantly positively correlated with inflation rate and negatively correlated with trade openness. It indicates that a high deposit rate is more likely associated with a high inflationary environment, but is associated with countries with lesser trade openness. Inflation rate is also correlated at minus 47 percent with financial openness, possibly suggesting that countries with restrictive financial policy would tend to experience high inflation than those with more open financial policy.

Corruption and bureaucracy variables also show positive high correlation at 57 percent , which indicates that countries that have administrations that are perceived highly bureaucratic, i.e. independent and detached from political interferences, tend to be more corrupted than those that are less bureaucratic.

## **6.4 EMPIRICAL ANALYSIS**

### **6.4.1 Main Findings**

The results of the Hausman test shown in [figure 6.2](#) for data collected from period 1984 until 2006 indicate that the chi-square statistic is at 38.8 and the null hypothesis is therefore rejected at 1% significance. Since it is rejected, the fixed effect model is preferable over the random effect model. Fixed effect model allows the intercept for each individual to vary, but restricts the slope parameters to be constant across all individuals and time periods. This model of parameter variation specifies that only the intercept parameter varies, not the slope parameters and the intercept vary only across individuals and not over time. Also the assumptions are the errors  $e_{it}$

**FIGURE 6.2 DETERMINING RANDOM OR FIXED EFFECT**

Correlated Random Effects - Hausman Test

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	38.824	11.000	<b>0.000</b>

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
_2GDPCAP_GTH	0.101	0.114	0.000	0.489
_2LGDP_CAP	2.540	2.663	0.185	0.774
_2YTH_DEP	-0.287	-0.301	0.002	0.767
_2OLD_DEP	-1.122	-1.063	0.110	0.859
_3CRD_PRV	0.023	0.014	0.000	0.017
_3STVALTRADED	1.812	1.855	0.028	0.798
_3LR_DEPINT	0.148	0.255	0.001	0.003
_4L_INF	0.189	0.231	0.002	0.364
_4UBN_GTH	0.296	0.640	0.014	0.003
_5OPEN07	0.007	0.035	0.000	0.005
_5KAOPENESS	-0.153	-0.001	0.005	0.035

Cross-section random effects test equation:

Dependent Variable: \_1S\_GDP

Method: Panel Least Squares

Date: 02/06/10 Time: 01:40

Sample: 1 480

Periods included: 24

Cross-sections included: 18

Total panel (unbalanced) observations: 265

	Coefficient	Std. Error	t-Statistic	Prob.
C	14.459	10.644	1.358	0.176
_2GDPCAP_GTH	0.101	0.068	1.479	0.141
_2LGDP_CAP	2.540	0.975	2.604	0.010
_2YTH_DEP	-0.287	0.142	-2.016	0.045
_2OLD_DEP	-1.122	0.599	-1.874	0.062
_3CRD_PRV	0.023	0.013	1.830	0.068
_3STVALTRADED	1.812	0.621	2.918	0.004
_3LR_DEPINT	0.148	0.198	0.746	0.456
_4L_INF	0.189	0.216	0.879	0.381
_4UBN_GTH	0.296	0.395	0.749	0.455
_5OPEN07	0.007	0.017	0.429	0.668
_5KAOPENESS	-0.153	0.263	-0.580	0.562

**Effects Specification**

R-squared	0.946	Mean dependent var	24.789
Adjusted R-squared	0.939	S.D. dependent var	13.168
S.E. of regression	3.248	Akaike info criterion	5.297
Sum squared resid	2,489.562	Schwarz criterion	5.689
Log likelihood	-672.836	Hannan-Quinn criter.	5.454
F-statistic	146.560	Durbin-Watson stat	0.402
Prob(F-statistic)	0.000		

are independent, with mean zero and constant variance  $\sigma_e^2$ , for all individuals and all time periods. Given this assumptions, it follows that all behaviour differences between the individual countries and over time are captured by the intercept. Individual intercepts are included to “control” for these individual specific differences.

In the fixed panel, we used the option of cross country weighted and White test. We use the weighted least square option to correct heteroskedasticity for GLS estimator. It has the effect of minimizing the weighted sum of squared residuals, where each squared residual is with  $1/h_i$ . Less weight is given to observation with higher error variance. The WLS estimator is  $b_j$  values that make it as small as possible from the following variance (Wooldridge, 2008).

The fixed effect panel data model is therefore estimated for a combined sample of 20 selected emerging economies and the results are shown in Table 6.4. The results for fixed effect regression shown in Table 6.4 are separated in 3 main groups:

- a) Column 0 to 6. Each institutional variable is being introduced individually with the demographic, financial and macroeconomic variables act as the control variables.
- b) Column 7 to 10. Institutional variables are grouped together to measure the institutional accumulative effects on private savings.
- c) Column 11 to 15. Each institutional variable interact with credit to private sector, i.e. proxy to finance development, to measure the indirect financial deepening effect of each institutional factor towards private savings.

Column 1 is the result from regressing using the basic stripped down Life Cycle Model without any institutional factors added to it. The result indicates that GDP per capita growth and per capita income is positively related at one percent significance with private savings. Even if institutional variable is added to right hand side (RHS) of the equation, we found that

**TABLE 6.4** **FIXED EFFECT WITH ICRG NON-MARKET INSTITUTIONAL DETERMINANTS**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C	16.88***	18.02***	14.6***	19.45***	22.11***	13.49***	17.64***	19.09***	23.96	23.36** *	39.14***	19.67***	21.63***	8.3***	22.13***
GDPCAP_GTH	0.13***	0.13***	0.13***	0.13***	0.11***	0.11***	0.13***	0.13***	0.12***	0.10**	0.14***	0.16***	0.13***	0.09***	0.12***
LGDP_CAP	2.62***	2.48***	3***	2.1***	2.68***	2.88***	2.68***	2.34***	2.62***	2.58***	1.26***	3.08***	2.4***	2.63***	2.87***
YTH_DEP	-0.32***	-0.33***	-0.29***	-0.38***	-0.37***	-0.29***	-0.33***	-0.40***	-0.46***	-0.47***	-0.54***	-0.3***	-0.37***	-0.28***	-0.35***
OLD_DEP	-1.14***	-1.13***	-1.17***	-0.87***	-1.4***	-1.01***	-1.16***	-0.88***	-1.21***	0.92***	-1.29***	-1.5***	-1.07***	-0.5***	-1.32***
CRD_PRV	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.02***	0.024**	0.03***	-0.08***	-0.04***	-0.02	0.08***	-0.03
STVALTRADED	0.42	0.45*	0.44	0.47*	0.30	0.23	0.55	0.59	0.49	0.34	0.72	0.67	0.33	0.83***	0.17
LR_DEPINT	0.34***	0.33***	0.41***	0.33***	0.39***	0.32***	0.38***	0.42***	0.48***	0.42***	0.24***	0.45***	0.34***	0.33***	0.36***
LG_INF	0.31	0.29	0.26	0.28	0.04	0.28	0.22	0.18	-0.11	-0.07	0.26	0.31***	0.3***	0.42***	0.10
UBN_GTH	-0.21	-0.20	-0.36	0.05	-0.33	-0.13	-0.35	-0.09	-0.25	-0.07	-0.02	-0.61***	-0.16	0.01	-0.33
OPEN	0.02	0.02	0.01	0.01	0.03***	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.00	0.02
KAOPENESS	-0.34	-0.33	-0.35	-0.35	-0.45***	-0.38***	-0.31	-0.33	-0.42**	-0.42**	-0.34	-0.26	-0.4***	-0.23	-0.26
Corruption		0.07					0.25	0.20	0.15	0.14			-0.39		
Law & Order			-0.19				-0.29**	-0.38***	-0.42***	-0.40***		-0.77***			
Bureaucracy				0.31				0.36***	0.34***	0.39***	-0.65***				
Stability					-0.44***				-0.47***	-0.47***					-0.84***
Accountability						-0.04				-0.11				0.72***	
Corruption & Prv Credit													0.01***		
Law & Order & Prv Credit												0.01***			
Bureaucracy & Prv Credit											0.01***				
Stability & Prv Credit															0.01**
Accountability & Prv Credit														-0.01***	
Adjusted R2	0.97	0.97	0.94	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97

\*\*\* significant at 1 percent level

\*\* significant at 5 percent level

\* significant at 10 percent level

GDP per capita growth and GDP per capita is still positively related at one percent significance with private savings. This connotes that the higher is per capita growth and per capita income level, the greater is the private savings ratio. The youth and old dependent variables result shows that both of them are significantly related to private savings, even though negatively. This signifies that the lower is the youth and dependency share of population, the higher will be the private savings. Looking across the column when the institutional variables are added to the equation, the youth and old dependency variables remain negatively related at one percent significance with private savings.

The elasticity coefficient for youth dependency ratio ranges from minus 0.28 to minus 0.54. In another words, one percent increase in youth dependency age group over total population, would decrease private savings ratio over GDP by minus 0.28 to minus 0.54 percent. The old dependency variable shows negative relationship with one percent increase in old dependency youth population resulting in decrease of savings between 1 to 1.5 percent of savings. The results confirm with previous studies (e.g. Leff, 1969; Fry, 1973; Fry and Mason, 1982; Shultz, 2004; Hondroyannis et al, 2005) that have found an inverse relationship between old and dependency population with savings.

The deposit interest rate shows a positive significant effect at one percent on private savings across the column even with institutional variables added in. The coefficient ranges from 0.24 percent to 0.45 percent, which indicate that one percent increase in real deposit interest rate would increase private savings by 0.24 to 0.45 percent. The positive coefficient indicates that the substitution effect is more dominant than the income effect. The result is consistent with the hypothesis by McKinnon (1973) and Shaw (1973) and the empirical studies by Gupta (1984), Balsa (1992), and Hondroyannis et al (2005), all of which find the positive relationship between real interest rates and savings.



GDP growth variable is also significant and the coefficient does not change substantially even after institutional variables are added in. A one percent increase in GDP growth contributed to 0.10 to 0.13 percent increase in private savings. The result is consistent with the rest of the other finding from previous literatures, e.g. Carroll and Weil (1994); Masson et al, (1998); Chowdry, (2004); and Schrooten and Stephan, (2005), which argue that economic growth has a significant impact on aggregate savings.

The effect of credit to private sector as a proxy for financial development provides a mixed signal. When all the macroeconomic and demographic variables, i.e. column 1 of Table 6.4, are regressed together, the variables show insignificant relationship with private savings. Similarly, when each of the ICRG variables, i.e. corruption, law & order, bureaucracy, stability, and accountability were inserted one at a time, as shown in columns 2 to 5 of Table 6.4, credit to private sector does not reflect significant relationship with private savings. This indicates that in an environment when only each of the institutional variable exist, credit to private sector or financial development may not play a significant role in affecting savings. However, when the institutional variables are grouped together, as shown from column 7 to 10, credit to private sector variable becomes significant. This connotes that when the all the institutional factors coexist, financial development proxy by credit to private sectors, becomes a significant factor affecting private savings. Based on this coefficient, a one percent increase in credit would result increase in private savings by 0.02 percent. Even when we decided to interact financial development variable with other institutional variables to measure the indirect significance of financial deepening, we find that financial development played a significant impact on private savings. We postulate that credit to private sector play a significant and positive role in influencing private savings in an environment where institutional factors prevail.

The result using share value traded over stock exchange to measure the impact of financial market on private savings (as shown in row 6 in [Table 6.4](#)) shows insignificance with or without institutional variables being introduced into the equation. This signifies that the deepening of financial markets seems not to have any significant impact on the aggregate private savings.

Other control variables that we used in the equation are inflation, urbanisation, financial openness and trade openness. The urbanization variable does not have any significant impact across all equations with and without institutional variables together. Similarly inflation does not reflect any significant impact on savings with or without institutional variables, except for columns 12 to 14, when we include the interaction of financial development variables with law and order, corruption and accountability variables. It can be interpreted that inflation has a significant positive impact on private savings in a country where there is deepening in financial sector is caused by prevalence of law and order, accountability or corruption.

Trade openness shows an insignificant impact on savings in all the equations with or without the institutional variables, except in column 5. Apparently, trade openness has a negative effect on private savings in a country experiencing political stability,.

Financial openness variable, which is synonymous with financial liberalisation, shows very mixed results. Financial openness shows negative significance effect in column 5 and 6 in [Table 6.4](#), when stability and accountability institutional variable are added separately into the equation. This indicates in an environment of stability and accountability, financial openness has a significant negative impact on private savings. Also, in columns 9 and 10, the financial openness variable shows a negative significant impact on savings when all institutional variables regressed together. This could only mean that when all the institutional factors were present contemporaneously, instituting financial openness would negatively impact private savings, due to the population tendency to spend more.

The next stage is to understand the impact of these institutional variables by regressing them against private savings. Each institutional factor is being added one at a time into the equation as shown from column 2 to 6 in Table 6.4, while keeping the demographic, financial and macroeconomic variables as the controlling variables. The result indicates that only the political stability variable (Column 5) has a significant effect on private savings. The sign shows that political stability has significant negative impact on the private saving ratio, suggesting that when political stability deteriorates, the population will save more for precautionary measures in the event the condition becomes worse. The results agree with the findings by Gyimah-Brempong and Traynor (1996) on sub-Saharan countries who find that unstable politics have a detrimental effect on aggregate savings.

With the institutional variables being regressed simultaneously, in other words all the institutional factors coexist contemporaneously, we find that most of these, such as law and order, bureaucracy and political stability, show significant impact on private savings, as depicted in column 7 until 10 of Table 6.4. Law and order from column 7 to 10 shows negative relationship, which is indicative that a country with less law respecting and abiding population, the aggregate savings will increase. Bureaucracy variable from column 8 to 10 shows positive impacts against private savings, which meant that more effective is the government bureaucracy, the higher is the aggregate private savings. Political stability from column 9 and 10 shows significant negative impact against private savings. It can be inferred that a country that is less politically stable will experience increased in aggregate savings. Only two institutional factors, i.e. corruption and accountability, do not show any significant effect on private savings.

In contrast to the negative relationship in our findings between law and order against private savings, Dollar and Kraay (2000) and Butkiewicz and Yanikkaya (2006) studies find the positive relationship between rule of law and a country's growth. Our findings on the positive impact of

effective bureaucracy on private saving is similar to the result by Ali (2003) and Mauro (1995), who found that effective bureaucracy is important to spur the country's economic growth.

The next step is to analyse specifically the effect of institutional factors towards financial deepening by interacting both variables together. Do the institutional factors magnify the effect of financial development towards private savings? Columns 11 to 14 not only examine the impact of each institutional factor individually, but also the interactivity with financial development, in affecting private savings. The results show significant positive coefficient on private savings when financial development interacts with each institutional factor such as bureaucracy, law and order, corruption and stability, as depicted in column 11, 12, 13 and 15 of Table 6.4. This show that the increase in the level of bureaucracy, law and order, corruption and political stability have deepening effects towards financial sectors to positively affect private savings. Studies by Wiggler et al (2000), Beck et al(2003), and Himmelberg et al. (2000) shows the importance effective legal institutions and investor protection in ensuring improved and effective development in financial sectors. Beck et al (2003) show that improved legal and regulatory environment would have a positive impact in financial development of a country.

On other results, the interaction between accountability with credit to private sector variable resulted in negative effect on private saving as depicted in column 14 of Table 6.4. This shows that when accountability or transparency measures were instituted to deepen the financial sectors, the effect is negative on aggregate private savings. This result is supported by Chin and Ito (2007) , who found that the deepening of financial system as a result of better legal, less corruption and open financial market did not have a significant effect on improving the country's aggregate savings.

When the three institutional factors, i.e. bureaucracy, law and order and political stability, are regressed individually against private savings, the result shows insignificant relationship with

private savings. However, when the three variables are regressed together, they show significant effect as depicted from column 7 to 10. Furthermore, when these three institutional factors interact with credit to private sectors as shown in column 11 until 15, the result shows significant relationship with private savings.

We can conclude that from consistency and significance of the results, the three institutional factors - bureaucracy, law and order and political stability - have significant effects on private saving either directly or indirectly via deepening effects on financial sector towards private savings.

#### 6.4.2 Robustness Test

Another source for institutional data is the Worldwide Governance Indicators (WGI) based on a research project covering 212 countries, which stretches from 1996 to 2007. The World Bank project headed by Kaufman, Kraay and Mastruzzi (2008) collect data for 1996, 1998, 2000, and yearly from 2002 until 2007. The indicators are based on several hundred individual variables measuring perceptions of governance, drawn from 35 separate data sources constructed by 32 different organizations from around the world. The areas are similar to the ones covered by ICRG database. The areas covered and the explanations are as below:

- i. Voice and Accountability. It measures the level of participation of the public in selecting the government elected officials. It also measures the freedom of expression, association and media. Essentially the “voice and accountability” underlies the extent to which the government is perceived to be democratic, transparent and accountable. The higher the index, the more democratic and transparent is the government as perceived by the public.
- ii. Political Stability and Absence of Violence. It measures the perception of whether the government can easily be overthrown through illegal or unconstitutional means.

- iii. Government effectiveness measures the perception indicating the ability of the civil servants to run the government administration, independent from political pressures. It also measures the quality of formulating policies and government's ability to implement the policies.
- iv. Rule of Law measures the public's perceived level of confidence towards the law and orders. It also includes the elements of contract enforcements, property rights, the current effectiveness of police and courts.
- v. Control of Corruption: Measures the public's perception towards the politicians, elites and special interest in gaining unfair advantages by means of bribe and unfair patronage.
- vi. Regulatory Quality: Measure the perception of the government effectiveness to formulate rules, policies and procedures in order to promote private sector development. It measures the government's regulatory bodies effectiveness to carry out the duties entrusted.

All the units in which governance is measured follow a normal distribution with a mean of zero and a standard deviation of one in each period. All the scores lies between -2.5 and 2.5, with higher scores corresponding to better outcomes and all have been normalised to the scale of 0 to 1.

Similar to [Table 6.4](#), the results for fixed effect regression in [Table 6.5](#) are separated in 3 main groupings:

- i. Column 0 to 6. Each institutional variable is being introduced individually with the demographic, financial and macroeconomic variables act as the control variables.
- ii. Column 7 to 10. Institutional variables are grouped together to measure the institutional accumulative effects on private savings.
- iii. Column 11 to 15. Each institutional variable interact with credit to private sector, i.e. proxy to finance development, to measure the indirect financial deepening effect of each

TABLE 6.5	FIXED EFFECT WITH KAUFMAN NON-MARKET INSTITUTIONAL FACTORS																		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
C	64.1**	58.43**	61.73**	64.54**	57.57**	57.43**	55.29**	61.94**	67.05**	67.09**	68.7**	60.8**	52.83**	65.01**	65.4**	75.35**	56.29**	56.62**	
GDPGAP_GTH	0.15	0.06	0.06	0.04	0.06	0.10	0.06	0.07	0.05	0.05	0.10	0.08	0.05	0.09	0.05	0.17***	0.10	0.06	
LGDP_CAP	1.81	2.35	2.07	2.62*	2.56	1.24	1.83	1.99	2.29	2.28	0.79	1.23	2.59	2.43	2.28	1.21	1.34	1.87	
YTH_DEP	-1.64**	-1.67**	-1.73**	-1.75**	-1.68**	-1.54**	-1.7**	-1.73**	-1.78**	-1.78**	-1.67**	1.67**	-1.63**	-1.74**	-1.77**	-1.91**	-1.53**	-1.72**	
OLD_DEP	-1.93**	-1.96**	-1.93**	-2.34**	-1.97**	-1.35	-0.78	-1.93**	-2.31**	-2.31**	-1.64*	-0.77	1.82***	-2.34**	-2.38**	-1.63	-1.35	-0.83	
CRD_PRV	0.03	0.02	0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.02	0.02	0.04*	-0.04	0.06	-0.04	0.03	0.00	
STVALTRADED	0.11	0.05	0.09	0.09	0.04	0.55	0.52	0.09	0.12	0.12	0.66	0.93	0.14	0.03	0.10	0.09	0.58	0.50	
LR_DEPINT	0.56**	0.53***	0.54***	0.58**	0.56***	0.5***	0.48**	0.54***	0.58**	0.58**	0.53***	0.54**	0.53***	0.52**	0.59**	0.92**	0.50	0.48**	
LG_INF	1.35**	1.78**	1.77**	1.63**	1.73**	1.63**	1.55**	1.77**	1.62**	1.63**	1.53***	1.24**	1.81**	1.71**	1.63**	1.01	1.66**	1.53**	
UBN_GTH	0.52	0.93*	0.89	0.84	0.91	1.35	0.9*	0.89	0.82	0.82	1.23***	1.15**	0.92*	0.88	0.81	0.69	1.33**	0.89*	
OPEN	-0.01	0.00	0.00	0.01	0.00	0.01	-0.02	0.00	0.01	0.01	0.01	-0.01	0.00	0.01	0.01	0.01	0.01	-0.02	
KAOPENESS	0.41	0.74	0.71	0.74	0.75	0.33	0.65	0.70	0.71	0.71	0.26	0.30	0.76	0.65	0.70	0.74	0.34	0.62	
corruption		0.03						0.02	0.01	0.01	-0.01	-0.03	0.13						
Rule of Law			0.08					0.08	0.05	0.05	0.11	0.00		-0.18					
Gov. Eff'nss				-0.19					-0.19	-0.19	-0.18	0.19***			-0.07				
stability					0.01					0.00	-0.01	0.01				-0.06**			
accountability						0.12**					0.12**	0.11**					0.15		
Reg. Qlty							0.4**					0.36**						0.34***	
Corr & Prv Cred													0.00						
L&O & Prv Cred														0.00					
Govt Efft & PrvCredit															0.00				
Stab & PrvCredit																0.00**			
Acc't & PrvCredit																	0.00		
Reg Qty & PrvCredit																		0.00	
Adjusted R2	0.97	0.96	0.96	0.97	0.96	0.97	0.97	0.96	0.96	0.96	0.97	0.97	0.96	0.97	0.97	0.97	0.97	0.97	

\*\*\* significant at 1 percent level  
 \*\* significant at 5 percent level  
 \* significant at 10 percent level

institutional factor towards private savings.

On the robustness test, we regress using institutional factors constructed by Kaufman, Kraay and Mastraazi from 1996 until 2007 (Kaufman et al, 2008). Likewise, all control variables, i.e. demography, financial and macroeconomics, are to be regressed in the same period as Kaufman institutional variable. Similar methodology, i.e. fixed effect model is to be used with Kaufman institutional factors. The result of the test can be referred to Table 6.5.

Firstly, based on the control variables, GDP per capita growth and credit to private sectors results show mix signal as most of the regression do not show any significant relationships against private savings with and without augmented institutional variables, except only in equation 15 for GDP per capita growth and equation 12 for credit to private sectors. Therefore, we can conclude that growth and financial development do not have any significant impact on private savings for all the selected emerging economies.

Both youth and old dependency population show significant effect across all the equations, therefore it reconfirms the finding of previous literature (e.g., Soyoung and Jong-Wha, 2008; Schrooten and Stephan, 2005; Hondroyiannis et al, 2005; Higgins and Williamson, 1996; Kelly and Schmidt, 1996; Maxwell Fry and Mason; 1982, 1988), indicating there is negative relationship between old and young dependency with private savings.

Share value traded as proxy for financial market does not show any significant effect on private savings across all equations. Real deposit interest rates and inflation rates show significant positive effect on private savings across all the equations with and without augmented institutions variables. One percent increase in real deposit rates results in increase of approximately of 0.5 percent in



aggregate private savings across all equations. The positive relationship in real interest rates indicates the substitution effect is more dominant than income effect when all the institutional factors are being considered.

Similarly, one percent increase in inflation will result increase of 1 to 1.8 percent of aggregate savings. Similarly, the positive effect that the inflation rate has on private savings indicates the precautionary effect causing the population to save more in the face of increasing uncertainties.

Urbanization factor provides mixed results as several equations, i.e. equation 1, 6, 10, 11, 12 16 and 17, show significant effect while others do not indicate any relationships. In equation 6, the urbanisation variable shows positive effect when regulation quality, i.e. the only one institutional variable, shows significant affect on savings . Similarly, in equation 10 and 11 when all the institutional variables are being factored collectively, urban growth variable shows significant impact on savings. In equation, 12, 16 and 17, urbanisation factor also becomes significant when corruption, accountability and regulation quality interact with financial development to measure institutional deepening impact on financial sectors. Based on the consistency of significance, it can be interpreted that urbanization becomes significant at only certain conditions, mainly when quality of regulation become significant in affecting saving as indicated in equation 6, 11 and 17. Therefore, it can be interpreted that urbanization has a positive impact on savings when the government is able to formulate and implement effectively the regulations to promote private sector development.

The use of financial and trade openness as the control variables do not indicate any significant effect in any equations in Table 6.5. Hence, it can be assumed that financial and trade openness do not have any impact on private savings in the presence of the institutional factors.

The next step is to examine the impact of institutional variables from equation 1 to 17. From column 1 until 6, each institutional variable is introduced individually into the equation. Only voice accountability and regulation quality have a significant positive effect towards aggregate savings. Voice accountability refers to ability of oneself to express and elect the preferred government to govern the country. In a more democratic government, the population tend to save more as they feel more safe and secured. Regulation quality refers to the ability of the government to promote the development of private sectors. The higher is the index, the greater is the effectiveness of the government in fostering the growth of private sectors. This meant that a government that encourages business friendly environment would encourage more savings.

The next section of robustness test is to test the effect of the institutional variables as a group as they are being introduced one at a time into the equation as illustrated from column 7 to 11. We find that in column 10, only voice and accountability shows positive significant effect after assembling together all five institutional variables into the equation. It illustrates that in an environment where the five institutional factors prevalent - corruption, rule of law, government effectiveness, political stability, and voice accountability - only voice accountability factor has significant positive impact in increasing the private savings of households and private sectors.

In column 11, when all six of the institutional variables are regressed together, three of them show significant results against private savings ratio, albeit one is negatively related. Government effectiveness shows it is inversely related to private savings. The negative relationship indicates that the less effective is the government in governing the country, the higher is the level of private savings. However, the result is considered unreliable as in the previous equation, i.e. equation 8 until 10, the government effectiveness variable did not indicate any significance when it is being regressed.

Regulatory quality as well as voice and accountability variables show positive effect towards aggregate private savings when they are regressed individually and group together. Studies that reflect the significance of voice and accountability can be traced from studies on democracy by the following researchers. Drury et al (2006) shows that democracy has a significant impact on political stability that indirectly affect economic growth. Sandholtz, and Koetzle (2004) and Hellman (1998) discover that ex communist economies that have embraced democracy were able to make significant impact on economic growth. Barro (1996) and Helliwell (1994) also results shows that democracy has an indirect positive effect on growth through education and investment factors. In conclusion, a country with quality regulation as well as accountable and democratic government will encourage more savings.

Similar to the test conducted on the ICRG institutional index, the next stage involved estimating the interaction effect between institutional factors with financial development, as shown in column 11 to 17 of Table 6.5. The results indicate that equation 15 is the only equation where the institutional variable, i.e. political stability variable, has the deepening impact on financial development. Based on the equation, there are two inferences can be made, i.e. i) political stability has a significant positive effect on private savings, and ii) the interactivity affect between stability and credit to private sectors indicates that political stability has a deepening effect on the financial sector, however the effect is negative on aggregate private savings. Apparently, in a country experiencing political stability and deepening in financial sector, the population tend to spend more than savings.

Based on the consistency and significance of the results using Kaufman institutional factors, we can make two inferences. Firstly, in an environment when there are several institutional factors present, a government that is accountable and democratic as well as possessing quality regulatory institution would experience increase in aggregate private savings. Secondly, even though political stability

would have deepening effect on the financial sector of the economy, it would have a negative effect on aggregate private savings; similar to results using ICRG database.

## **6.6 CONCLUSION**

The basic premise of the hypothesis proposed in this chapter is that a sound institutional framework, associated with good governance and policies would encourage more private savings in these countries. Specifically, in our empirical studies we examine the impact non-market institutions such as the level of corruption, adherence to law and order, political stability, effectiveness of bureaucracy and accountability. Three stages of panel data regressions were conducted to examine the impact of non-market institution variable. The first stage involves testing each institutional variable separately in the equations. The second stage is to group them together in order to examine the grouping dynamics. The third stage is to interact each of the institutional variables with financial development proxy by credit to private sector to measure their partial impact on savings through financial development.

In summary, the three stages of empirical analysis using the ICRG database indicators shows that political stability has shown a consistently negative effect on private saving. When all the institutional variables were regressed together, law and order variable which shows that it has negative impact on savings, in contrast to bureaucracy variable showing positive impact on savings. On the effect of financial development, all the five non-market institutional variables have a deepening affect onto financial sector that positively affected savings.

On the whole, our results support the hypothesis that non-market institutional variables do have a significant positive impact on private savings, except for two variables. Effective bureaucracy in the government seems to encourage increase in overall household and private savings. However, an

environment of sound political stability and adherence to the law and order seem to negatively affect the overall aggregate savings. The deepening effect on financial development by the non-market institutional variables is positively significant but the overall impact is considered minor. Based on the robustness test using Kaufman database, the result also indicates that government accountability and regulatory quality have shown consistent significant positive effect, either these variables being regressed individually or simultaneously together.

## **CHAPTER 7**

### **CONCLUSIONS**

#### **7.1 INTRODUCTION**

This thesis has investigated the role of institutional as well as traditional economic factors on savings and growth in light of the experience of 20 emerging economies over the past thirty years. The determinants of savings, financial development-growth nexus and non-market institutional-savings nexus were examined in detail to shed some light on these linkages which ultimately affect savings and investment behaviour at the aggregate level. The thesis has employed descriptive investigation, covered related theories and performed empirical analysis using pooling, time-series and panel estimation techniques to understand the dynamics and significance between savings and its determinants. The findings were carefully analysed and compared with previous findings and major events to understand these relationships. This final chapter presents an overview of the main theories and hypotheses, summarizes the key findings and draws relevant conclusions.

#### **7.2 RELEVANT THEORIES AND HYPOTHESES**

In summary, the major theories of savings and asset accumulation (LCH, PIH and Consumer Optimization Hypothesis) focus on the role of lifetime income and individual preferences. Studies by LCH primarily focus on the impact of demographic and macroeconomic factors in explaining their impact towards savings. PIH and consumer optimization models aim to rationalise the household decision over time based on the opportunity cost and prevailing interest rate in deciding the magnitude between savings and consumptions.

In studying savings, it is essential to take account of the role of financial development and growth in a country. Without financial development, aggregate savings would be undermined as there won't be a place where savers can keep their money safe and earn modest returns. Growth is also important as it relates to economic well being of the economic agents, i.e. the income of the households and private sectors. Most theories on financial intermediation have pointed out the importance of developing the finance sector as a prerequisite for the country's economic growth (Diamond and Dybvig, 1983, Becievenga and Smith, 1991; Greenwood and Johnson; 1990).

Several differences among previous findings have developed regarding prioritization of the importance among these two variables, financial development and income (GDP) growth, and Chapter 5 examine the issue in more depth. Theories of financial liberalisation led by McKinnon and Shaw shows the indispensability of liberating the financial system from the government interference so that the countries are able to grow faster. It is important for the financial institutions to be able to function effectively and efficiently by distributing the financial resources accordingly and perform their role as effective intermediaries linking those surplus units with those who are rightfully in need.

Ultimately, the financial system should perform its role in transforming the economy's savings into productive investment opportunities, directly through the financial markets or indirectly through financial intermediaries, by minimizing the transaction cost and provide modest return to its customers and investors.

On the other hand, La Porta et al (1997, 2003), and Acemoglu et al (2001, 2004) among others have emphasised the importance of property rights and the role of contracts in affecting the country's financial development and economic growth. However, they differ on the origination or causation that prompted the development of property rights and contracts in trading. La Porta et al highlighted

the importance of the institutional system based on legal origins; in contrast, Acemoglu et al (2001) proposed the endowment hypothesis based primarily on settlers' mortality rate, while Acemoglu (2004) proposed the political institutional hypothesis hinging on de jure and de facto political institution.

Several studies conducted by Beck et al, (2003a and 2003b) also investigate the link between property rights, financial development and growth. The enforceability of property rights reflects the extent of the market forces in shaping the overall distribution of resources effectively. However, none of the studies have examined in detail the impact of these non-market institutional factors, e.g. corruption, bureaucracy, stability as well as law and order on aggregate private savings in these emerging economies.

The dispute on property rights mainly concern between the government and private sectors, which includes the public in general. The extent of property rights provided by the government to private sectors determine the freedom the free market enjoys without the interference from the higher up political power. The extent of non-interference by the political power also determines the extent of effectiveness of the role of financial sectors. Financial institutions that are subjected to needless interference from the political hierarchy are coerced to provide financial resources to preferential economic sectors rather than leaving to the market discretion to decide.

As for the general public, the lack of proper and effective bureaucracy will cause them becoming frustrated due to needless red tapes that impede or slow down the delivery of services. Even simple procedures requiring government official endorsement become too complicated and cumbersome as numerous red tapes causing difficulties obtaining licenses and approvals. Corruption becomes rampant and becomes the norm to speed up government approvals as the public realises that the only



way to beat these red tape is by giving kickbacks. There is less transparency and accountability by the government as they feared there will be more public outcry as the public would soon realise the scale of corruption. The public would not respect and abide the rule of law as they felt the government and the politician were practicing double standards as they do not adhere to the laws in the first place. Laws were made to be flouted or used as a repressive tool designed for their own political interest. The adverse effect to the economy is considered “economic rent” and renders costly to the long-term economic growth. This costly economic rent has a grave negative consequence to the growth of the economic as well as financial sectors as the population mistrust the government rule of law and perceived acceptable to be flouted. Foreign and local investors would be wary of the unsettling economic environment and uncertainty in recovering their investment.

In view of the above circumstances, depositors and private savers would be less inclined to deposit their savings in the country’s financial institutions. The greater the uncertainties that are prevalent, the lesser will the amount of savings and the lesser will be the degree of financial development and economic growth. The purpose of this thesis has been to highlight the importance of both economic and institutional factors in the determination of savings behaviour focussing on the emerging market economies.

### **7.3 TRENDS AND DESCRIPTIVE ANALYSIS**

Prior to the empirical analysis, descriptive analysis of the economic trends and patterns of 20 emerging economies was undertaken as discussed in Chapter 3. This section summarises the main finding of these trends and patterns of the 20 emerging economies, located mainly in three separate regions, i.e. Latin America, MENA and Asia Pacific, that stretches for more than thirty years. Saving and its likely determinants were analysed based on trends and underlying social, political and

economic factors that have affected them. In general savings shows a steady decline in Latin America and MENA region from average of 21 percent in 1970 to 16 percent in 2000-2004. However, savings in Asia Pacific region has experienced steady increase from 21 percent in 1970 to 29 percent in 2000-2004. Based on previous theories and findings, the primary determinants of savings are the economic, financial and demographics factors such as growth, inflation, interest rates and dependent aged population.

On average, the aggregate private savings in Latin America regions was steadily declining, except Chile whose savings has increased since the government decided to institute private pension system in 1981. Columbia has seen its savings remained constant until mid 1990s, when it started to decline due to declining price of its agriculture products. In Latin America, during the early 1970s until middle of 1990s, the region was undergoing political and economic turmoil. The oil crisis, regime turnover and inability of the governments to manage their economy have caused growth in Latin America to decline, similar to the decline in the saving rates (refer to chapter 3 - Table 3.6.2.1). On average most of the growth is less than 3 percent, except Chile has enjoyed better growth since mid 1980's from open economy policy and competent economic management.

Inflation and interest rates were at high levels and showing volatile fluctuations that has caused great uncertainties in 1980s until the end of 1990s that has adversely affected savings. Credit to private sectors proxy for financial development has shown a steady increase until 1990, before showing steady decline due to monetary policy tightening to mitigate the uncontrollable inflation and escalating debt. Based on the analysis of trends, credit to private sectors does not seem to be highly correlated and affected savings. This is due to the credit provided were mostly spent by households and private sectors on the escalating cost rather than for savings.

Youth dependency was showing a declining trend, except in Argentina where the rate remained relatively unchanged. Old dependency, in contrast, is showing an increasing trend. In other words, youth dependency has positive correlation with savings, whilst old dependency is showing negative correlation, contrary to the findings by other scholars. Urban growth shows similar declining trend since 1970s, which reflects positive correlations to savings. This indicates that increased in urban migration is correlated with improved aggregate savings.

Private savings in MENA region shows a mild U-shape trend declining in 1980's before resurging in 1990s. Yet, the savings level in 2000 is lower compared to 1970s. In 1970s and 1980s, oil crisis and Arab-Israel conflict have shaped the regional economic climate. The average high savings in the 1970s in MENA was mainly attributed to Saudi Arabia's high savings from income earned from increases in oil prices and non-oil producing countries reaping spill over effect from investment by other oil producing countries. Overall, GDP per capita growth in the region over 30 years is considered low and reflects mild U-shaped trend with lows in 1980s (refer to Chapter 3: Table 3.6.2.2). The trend similarities indicate that it has positive correlation with savings.

In early 1970s, the GDP per capita growth was extremely high due to unprecedented growth experienced in Saudi Arabia that has affected the average of the region. In 1980s, MENA has recorded negative growth due to severe growth decline in Saudi Arabia from oil price decline. Credit to private sector has been increasing steadily and the trend reflected inverse correlations with savings. Except in Egypt and Turkey between 1990 to 1994, their credit supplied dropped as both countries had to reduce it due to experiencing mounting debt.

Inflation also reflected a mild hump shaped trend in 1980s as most countries were experiencing peak inflation, especially Turkey, Israel and Egypt before declining. Inflation is perceived to be negatively

correlated with savings due to its inverse trend in relations to savings during that period .

Demographically, youth population in the region has been declining which reflects positive correlations with savings, somewhat contrary to theory. Old dependency has been increasing steadily, which reflects negative correlations with savings, consistent with the previous theories. Urban growth has remained relatively constant from 1970 until end of 1990 before it began to decline until 2006, which indicates it does not have similar trend as savings, therefore the relationship seems to be mixed and insignificant. Terms of trade for MENA shows mixed and inconsistent trend through the years and certain countries such as Saudi Arabia, Turkey and Israel have missing data in certain years.

Unlike the other two regions, Asia Pacific private savings has shown a steady increase from 1970 to 2004, except Philippines and Indonesia from 1995 to 1999 when their savings temporarily declined due to financial crisis. High savings in Malaysia and Singapore was due to compulsory savings by both governments with the establishment of Employee Provident Fund (EPF) in Malaysia and Central Provident Fund (CPF) in Singapore.

Growth in Asia Pacific region is better compared to other regions with recorded growth average more than 4 percent except from 1980 to 1984 due to recession from declined in price of agriculture products and in 1995 to 1999, and due to financial crisis from mounting debt. Only Philippines has average growth lower than 4 percent due to incessant political turmoil and natural catastrophe that has adversely affected the economy. Growth trend line show it remained constant and does not follow similar trajectory to savings, therefore we can postulate both variables are not significantly correlated.

Credit to private sectors shows an overall increasing trend until 2000, which reflects positive correlation with savings. However, in 2001 until 2004, there was a decline in credit to private sectors

as most Asia Pacific countries, i.e. Indonesia, South Korea, and Thailand, were undergoing financial restructuring, and pursuing cautious monetary policy. Inflation overall was undergoing steady decline even though inflation in this region was already considered very low compared with the other two regions. Only Indonesia, Philippines and South Korea experienced double digit inflation from 1970 to 1985, but yet the inflation was less than 20 percent. Due to its declining effect, inflation is considered to be negatively correlated with aggregate savings, which was steadily increasing.

Youth dependency similar to other regions shows declining trend from 42 percent in 1970 to 26 percent in 2006, which indicates a negative effect on private savings. Meanwhile, old dependency population was showing steady increasing trend line from average 3.5 percent to 6.6 percent from 1970 to 2006, which indicates its positive relationship with savings. Urban growth shows steady declining trend. The decline in urban growth indicates lesser migration to urban areas as compared to previous years. When urban migration declines, but saving rate increases, it therefore implies that urban migration is negatively correlated with aggregate savings.

## **7.4 PRIVATE SAVINGS AND DETERMINANTS**

The first formal empirical analysis undertaken in Chapter 4 was divided into two parts: the main analysis, which includes all the 20 emerging economies, and the robustness analysis, which subdivided the sample into three main regions, i.e. Asia Pacific, MENA and Latin American. We chose the methodology of Seemingly Unrelated Regression (SUR) on both main and robustness analyses for our empirical methodology to find the relationships between savings and its determinants. Several differences and similarities on the findings appeared from the main and sub-sample regressions.

Per capita growth in general and in particular growth in the Asia Pacific region shows a significant positive relationship in affecting private savings. However, in the MENA region, the result shows an insignificant relationship between growth and private savings. This may signify there are factors other than growth in affecting private savings. In Latin America region, the results are quite mixed when more control variables are added into the equation, per capita growth becomes insignificant. In crux, growth in Asia Pacific region affects savings more than other region.

All the results in the main part of the analysis show that youth dependent population has a significant negative effect on private savings. The Asia Pacific and MENA regions show similar findings, however, Latin America shows mixed results as findings in some equations are similar while others are insignificant. The results show that youth dependent population in Latin America does not contribute towards aggregate dissaving compared to the other two regions.

Old dependency population also shows negative significant effect on private savings in the main test. Regional-wise, the MENA region shows similar results, however, Asia Pacific and Latin American regions show mixed result. These results signify that retirees spending habit in Asia Pacific and Latin American region do not cause aggregate dissaving as postulated by LCH and most previous literatures.

The results of the main part of the analysis, which includes all emerging economies, shows that financial development impacts positively on private savings, albeit that the coefficient diminishes as more variables added. Asia Pacific and Latin American region also show similar result, however, MENA shows negative relationship. The negative relationship means that greater financial development causes savings to decline, the underlying reason being that as more credit becomes

available, households need to save less in order to buy high ticket items, such as houses, cars and others.

Based on the main results, real interest rate has a significant but negative impact on savings, which is similar to MENA and Latin American regions that shows significant yet negative effect on savings. In other words, the income effect is more dominant than the substitution effect on savings. In contrast, Asia Pacific region shows a positive significant effect indicating substitution effect is more dominant in this region. It can be interpreted that there is propensity to save in Asia Pacific region, in contrast to dissaving in MENA and Latin American region when the real interest rate rises.

All the regions, excluding Asia Pacific, display the inverse effect of Ricardian Equivalence, in which government savings has positive effect on private savings. On the other hand, Asia Pacific region shows non-Ricardian Equivalent effect as government savings do not indicate any significant effect on savings.

Latin American and Asia Pacific region inflation results were rather mixed. When we run the regression for the entire emerging economies, the result was also mixed. Only MENA region shows that inflation has a negative impact. It seems inflation does not have a substantial significant impact on saving in Latin American and Asia Pacific. Since inflation is normally used as proxy for time of uncertainties, it can be assumed that during period of uncertainties, it does not affect significantly the population to save or spend more.

Trade openness in Asia Pacific and Latin America show positive significant relationship with increased savings as the regions become more open. The result is also similar when all the regions are pooled together. Even though the openness effect in Asia Pacific region is significant the impact may be considered to be relatively minor given the small magnitude of the coefficient estimates. In

MENA region the result was mixed. The first few equations indicate significant positive effect, but as additional variables added the openness effect on savings becomes insignificant.

Terms of trade shows significant positive effect on savings when data for the 20 economies are pooled together. Similar results also reflected in all the sub-regions. Hence, the result shows that a favourable terms of trade has a significant impact in increasing saving in all emerging economies. A favourable terms of trade implies that in the long term the population income will grow, which will increase aggregate savings.

All the regions show urban growth has a significant effect on savings but the nature and orientation of the effect varies. Asia Pacific and MENA region urban growth has a negative impact, while Latin American region shows a positive impact. When we pool the data for all the countries together, all the emerging economies shows a negative impact. The negative impact shows that increase in urban growth causes the urban population to save lesser than when they reside in rural area; hence contributed to lesser aggregate savings. Several reasons can be given for the increased dissaving: mainly the availability of insurance and pension fund scheme would discourage the urban dwellers to increase savings. Secondly, it could be attributed to the high cost of living that has consumed most of their income for them to save.

The remittance impact on savings for all the emerging economies shows a significant but negative effect on savings. Similar results were also found in Asia Pacific region, where remittance shows a negative effect on savings. The negative results indicate that the more remittance flows into the host countries, the more dissaving occurs. The dissaving effect would indicate more spending by the households receiving the payment, instead setting aside certain fractions of the remittance for savings.



## **7.5 FINANCIAL DEVELOPMENT AND GROWTH**

Chapter 5 investigated the causality between financial development and economic growth within a panel cointegration framework. Firstly, using panel VAR analysis to test the short term relationship and causality among the selected emerging economies, the result shows that there is short run causality running from economic growth to financial development. We decided to extend the analysis by using Pedroni and Johansen cointegration methods to confirm whether there is a long term relationship. Both methodologies confirm that there is indeed a strong long term relationship.

After applying error correction terms within Johansen cointegration methodology, the result indicates that there is only univariate direction running from growth towards financial development. This is in agreement with the results by the majority of other studies which found that there is causality originating from financial development towards growth. (Levine and Zervos, 1998; Rajan and Zingales, 1998; Beck et al, 2000 and 2003; Wachtel, 2001; Christopoulos, 2004; Levine and Thorsten, 2004; and Ghirmay, 2005). The finding is in agreement with the endogenous growth hypothesis and the McKinnon and Shaw hypothesis, which in essence postulate that deepening and liberalizing the financial sector is prerequisite to improving the growth of the country.

Most economies in emerging economies began to open up during the middle 1980s after the resolution from the Washington Consensus. Evidently, most emerging governments began to pursue the course of economic restructuring and liberalizing the financial sector by allowing interest rates float and allowing more foreign equity holdings in the financial sector.

Import substitution industry has deemed failure and most countries are vying to attract foreign investors to invest and bring their expertise into their countries. Substantial loans were being

provided to the private sectors to allow them to start up or expand their existing business as reflected in figure 3.6.3.1 until 3.6.3.3.

As a result, during the early 1990s until mid 1990s, most emerging economies in all the regions are experiencing positive growth and a few of them are experiencing robust growth. Emerging economies in Asia Pacific have witness substantial growth with South Korea, Indonesia, Thailand, Malaysia, and Singapore registered growth of more than 6 percent average (Figure 3.6.2.3). India took a longer period to realise growth as they have more challenging and pressing economic and structural issues, such as dismantling complicated tariffs and allowing foreign investment to stake equity in various economic sectors. However, from 1995 until 2004, the country recorded more than 4 percent growth, which greater than period pre-1995. However, in 1997, due to lower investment yield and growing deficit, the foreign investors suddenly withdrew their funds from the region causing extreme cash flow shortages, which resulted most Asia Pacific economies contracted severely to near depression<sup>1</sup> until 1999. However, by 2002 most of these countries managed to recover, albeit not to the pre-financial crisis level.

In Latin America, most of the economies in 1980s and 1990s were grappling with high inflations and unstable political climate with frequent changes in regime. The 1994 Mexico financial crisis caused contagious adverse effect on the investment climate in other Latin American economies that caused investors to avoid from further investing there. There was less robustness on the effect of financial development compared to Asia Pacific region as far as providing more credit to spur economic growth.

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<sup>1</sup> Refer to Chapter 3 section 3.5, in which each of the Asia emerging economies are being described since 1970's. During the 1997, all of these countries are adversely affected, however, South Korea, Indonesia, Malaysia and Thailand are extremely affected, which cause these countries to seek substantial assistance from IMF.

There is restriction in increasing more credit by the government to the private sectors as the region was already mired in debt. Most of the credit supplied by international lenders was used to retire the mounting outstanding debt and only a small portion of the credit was used for new capital investment. Furthermore, by increasing money supply into the economy it would trigger further uncontrollable inflation that has been plaguing most of the Latin American economies since early 1980s.

MENA growth economies especially the oil producing countries, the economies was driven by the price of petroleum. North African countries which are non-oil producers, their economies were also undergoing financial transformation and liberalisation. Countries like Egypt, Morocco and Tunisia agreed to undergo financial liberalisation and opening of their economy as a precondition to receiving financial assistance from IMF to spur their economic growth. Israel and South Africa were undergoing major upheaval as South Africa went through economic and political adaptation from apartheid and isolated sanctioned economy into a newly open economy with new political regime. Similarly, Israel's economy was rocked endlessly by Jewish-Palestinian conflict that has severely affected its economy. However, the economic growth was helped with migration of highly skilled immigrants from previous Soviet Union satellite countries that enable the economy to migrate into high tech industry that has spurred the growth. The role of financial development did not contribute as much as other factors in contributing towards the region's economic growth.

The results from the “financial development and growth” empirical analysis were only able to confirm one of the two proposed hypotheses. Based on the second hypothesis - financial *development has a short run Granger causality effect on economic growth of the emerging economies* - our empirical result using VAR method shows the opposite, i.e. growth has short run Granger causality on financial development. However, the result from using the VEC Johansen F-test shows short term

bivariate effect, in which financial development and growth has short-term effect running from both directions. Due to two different results produced by both methods, the hypothesis, i.e. *financial development has a short run Granger causality effect on economic growth of the emerging economies*, has not been able to be rejected or confirmed.

However, on the third hypothesis - *financial development has a long term causality effect on economic growth of the emerging economics* - our empirical results indicate that indeed financial development has a long term causality effect on growth using Vector Error Correction Method (VECM). We hypothesise that financial development would be the driving factor to keep on sustainable growth as clearly shown in the growth of emerging economies since 1990s, except during 1997 financial crisis perceived as overdue correction in the financial market. Rapid growth spurred by rapid expansion of credits and development of financial markets has caused unsustainable growth such as 1994 Mexico and 1997 Asia financial crisis (Springer and Molina, 1995 and Mishkin, F., 1999). Only prudent monetary and fiscal policy would ensure sustainable growth for the long-term (Borio and Shim, 2007).

## **7.6 PRIVATE SAVINGS AND NON-MARKET INSTITUTIONAL FACTORS**

Earlier study by North (1990) has emphasised the need to have institutional framework based on protection of property rights and respecting law and order for the countries' economy to move forward. La Porta et al (1999) and Acemoglu et al (2001) have come out with their own hypothesis, i.e. legal origin and endowment respectively, to explain the source and origin of the current state of institutions prevalent in most countries. Rodrik (2000) has argued the importance of combining the “non-market institutions” that acts as regulatory, stabilizing and legitimising functions with *laissez faire* economy to ensure that free market is sustainable. The role of non-market institutions is to be

treated as complementary, instead of adversarial, so that free market ideals such as protection of property rights are able to flourish, especially in newly emerging economies.

Based on these set of reasoning, in Chapter 6 we tested on several “non-market institutional variables”, a term coined by Rodrik. All the indexes were obtained from the database compiled by ICRG group and Kaufman, Kraay and Mastruzzi under auspices from World Bank. The institutional factors were then tested along with other control variables, including demography, financial and macroeconomic variables, to determine the impact on private savings based on our hypothesis that non-market institutions have a significant positive impact in determining the level of aggregate savings.

The main empirical analysis in Chapter 6 examines the institutional factors based on the ICRG compilation. The institutional factors include, adherence to the i) rule of law, ii) effectiveness of bureaucracy, iii) level of political stability, iv) level of accountability or transparency and finally, v) level of corruption. Based on all 14 equations using Fixed Effect panel regression as shown in Table 6-4, our findings have revealed a few important facts.

One of the main results show that *political stability* has significant negative effect on private saving when each of the institutional variables tested separately. The negative relationship implies that the more politically unstable the country is, the greater risk-averse the public becomes and the more they will save.

The next step involved all the institutional variables being tested simultaneously, resulting in institutional variables such as *stability*, *law and order* as well as *bureaucracy* becoming significant. However, the coefficient for law and order and political stability variables is negative, while the bureaucracy coefficient is positive. The negative impact of law and order imply that in an

environment devoid of equality and enforcement of law as well as politically instability, the economy will experience an increase in private savings. As a result, the population becomes less confident of the way the government is being run that they decided to save more for precautionary purposes.

The other result indicates that the increased effectiveness of bureaucracy has a positive impact on the level of aggregate savings. Bureaucracy, which connotes efficient methods of organization, means that the more effective the government bureaucracy is in performing and dispensing its tasks, the more confident the public of the country's governance, which translates into increased savings by the public

The third test involved measuring the effect of non-market institutions have on financial development in affecting private savings, or in other words, the deepening effect that institutional factors may have on financial system that could affect private savings. This involved all the non-market institutional variables interacting with credit to private sector in the regressions. However, in each respective equation, there is also autonomous non-market institutional variable, which is not subjected to interactive effect (*Chapter 6: column 11 to 15 in Table 6.4*).

The results show after each non-market institutions variable - i.e. corruption, law and order, bureaucracy, stability and accountability - interact with credit to private sector, each combined variable shows positive significant effect on private savings, except accountability which show negative significance. However, except for accountability showing positive significance, the other autonomous non-market institutions have significant negative effect on private savings. The results indicate that even though non-market institutional variables have a deepening effect on financial institutions which positively affected private savings, the autonomous institutional variables have a negative effect on private savings that mitigates the positive impact of financial deepening. In other

words, since the negative coefficient of the autonomous non-market institutions is larger than the positive coefficient from the combined interactive variables, the overall deepening impact of the institutional variables becomes inconsequential.

The analysis is complemented by a robustness test using Kaufman et al index over a shorter period, which generated slightly different results. Instead of five institutional variables used by ICRG index, Kaufman index used six. Both indexes have variables that matched to each other except Kaufman has an additional variable, i.e. quality of regulation. After undergoing the first two empirical exercises, where non-market institutional variables are being regressed separately and later jointly together, the results reveal that *regulatory quality* and voice and accountability variable shows consistent positive significant affect on aggregate private savings. It connotes that a country with a government that is well endowed with effective regulatory bodies, able to effectively and efficiently perform the mandated responsibilities, will experience increased aggregate private savings. In addition, countries with government perceived to be democratic, transparent and accountable will also experience increase in private savings.

The final result on the interactions between institutional variables with financial development reveals that political stability has a significant deepening effect on the financial sector, but has negative effect on private savings. In other words, the climate of political stability has managed to assist the financial sector to thrive, however, has decreasing effect on the country's aggregate private savings.

In summary, the result in general supports the first hypothesis, i.e. sound institutional factors based on respect on property rights have positive effect in increasing aggregate private savings in the emerging economies as shown by the effect of bureaucracy, accountability and regulation quality. Effective bureaucracy in a government seems to provide the incentive to save further. It also meant

that the government is properly managed and resulted improvements in the public's confidence by investing their money into savings.

However, increased political stability and respect towards law and order seems to affect savings negatively by virtue of households and private sectors spending more than savings. In this respect, in an environment of political instability with less law abiding powers and respect for orders, the population will tend to save more as a precautionary measure. However, the deepening impact of the institutional factors on financial development has shown inconsequential effect despite showing certain significance. The robustness test instead shows two other institutional variables, i.e. regulatory quality and accountability, have shown consistent significant positive effect on savings.

Overall, the empirical analysis of Chapter 6 shows that government that have – i) effective bureaucracy in managing the country's administration ii) regulatory bodies that are able to formulate effective policies and procedures and iii) transparent and accountable in their governance – are able to create an environment for increased aggregate private savings conducive for further investment. These results support our overall hypothesis that non-market institutional environment has a positive effect on increasing aggregate private savings.

## **7.6 RECOMMENDED FUTURE RESEARCH**

Previous studies have not explored the impact of non-market institutional factors on private savings in emerging market countries. While this study takes a step further to formally investigate this hypothesis at the aggregate level, building up on the law, finance and institutions literatures, there are several areas that could be explored further as an extension of existing research. One possibility would be to investigate at the micro-level changes in the level of households' savings at country, state or city level and the effect of detailed composition of institutional factors affecting them. Due to



the rapid development of comprehensive regulation, improved governance and the fight against corruption in these countries, these enhancements may have a direct effect on the savings behaviour which would have an impact on level of overall household savings. It would also be interesting to explore the underlying and dynamic changes that these detailed institutional factors may have effect on behaviour of household savings.

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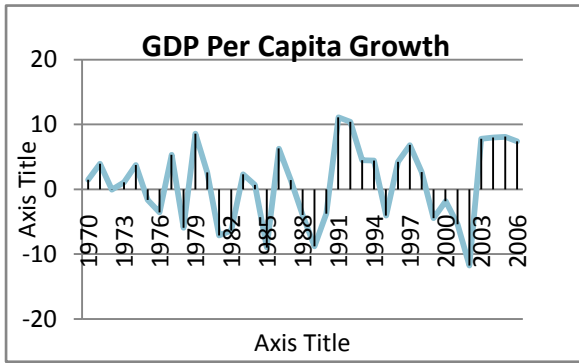
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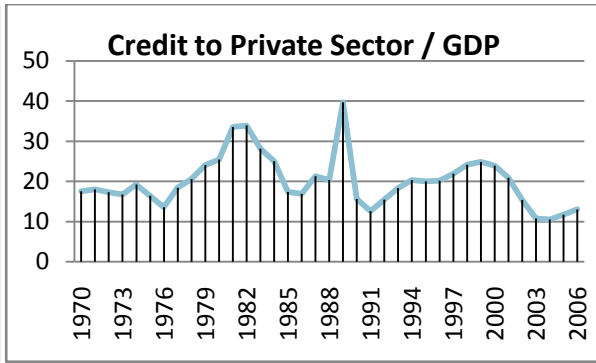
# ***APPENDIX***

# ARGENTINA INDICATORS

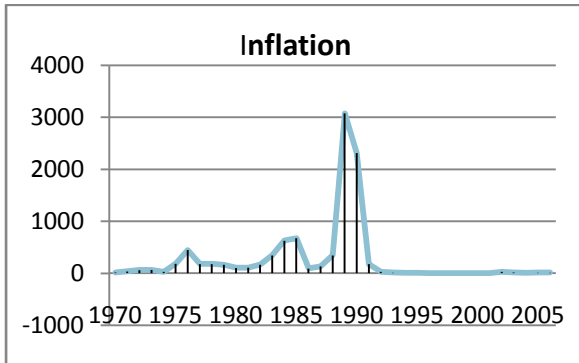
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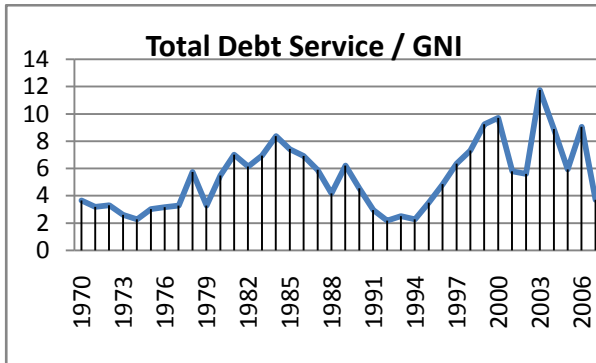
**EXHIBIT 1.2**



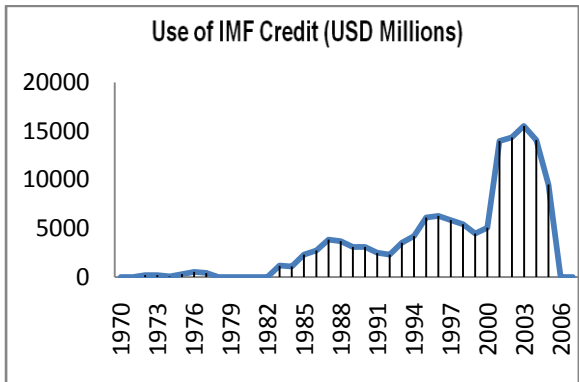
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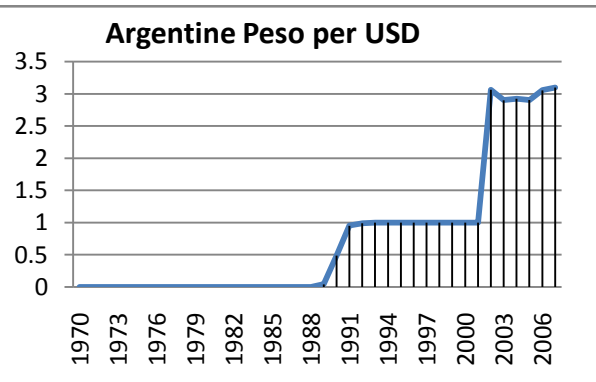
**EXHIBIT 1.4**



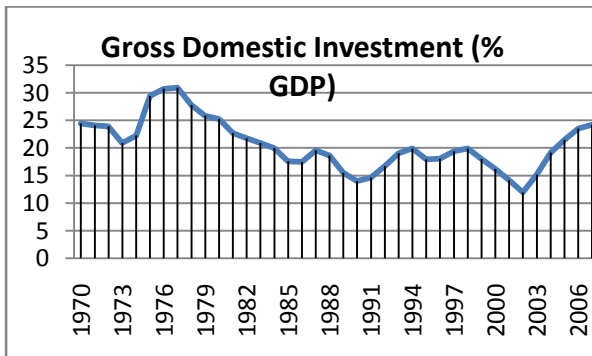
**EXHIBIT 1.5**



**EXHIBIT 1.6**



**EXHIBIT 1.7**



# BRAZIL INDICATORS

Exhibit 2.1

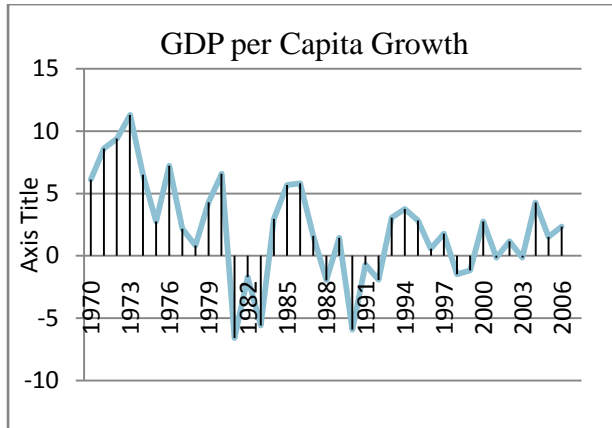


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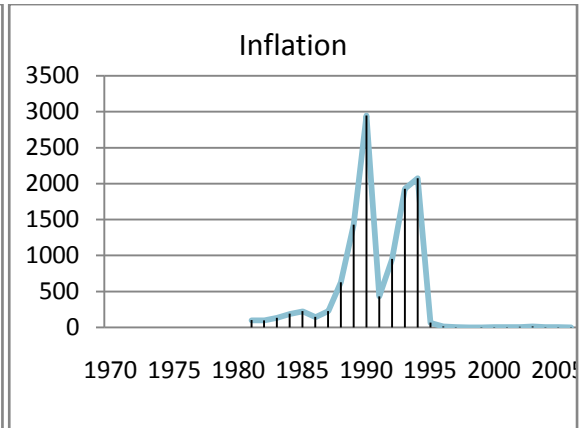


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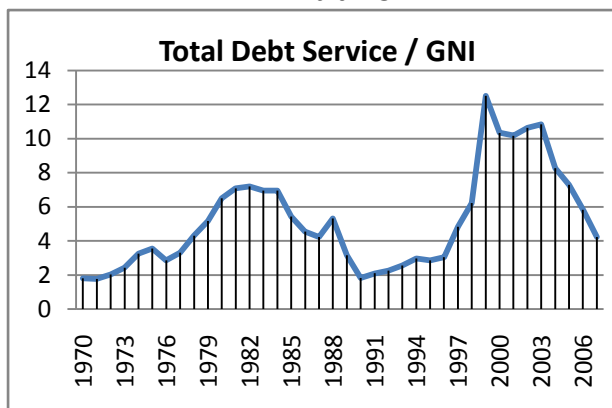


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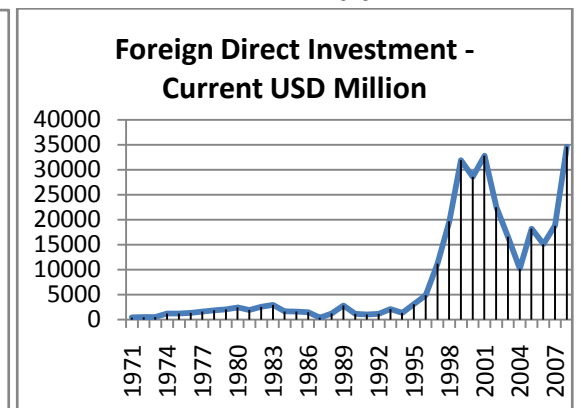


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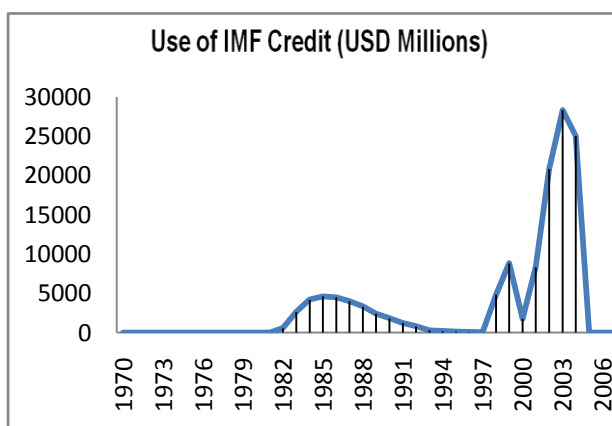
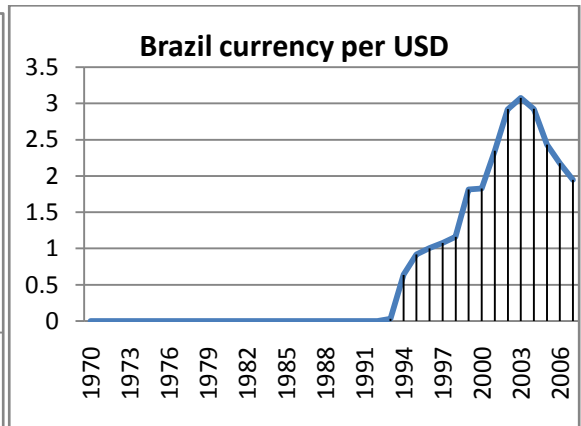


Exhibit 2.6



# MEXICO INDICATORS

EXHIBIT 3.1

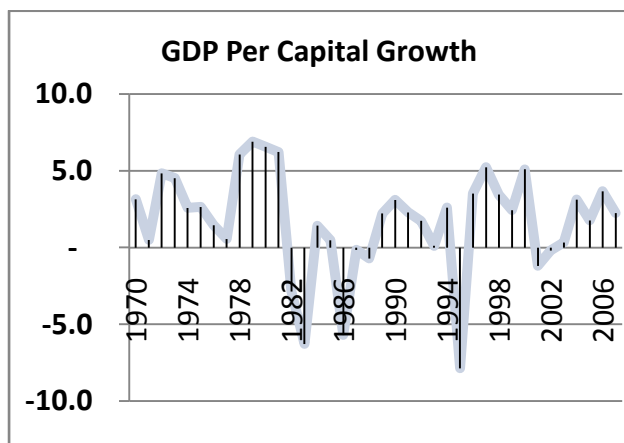
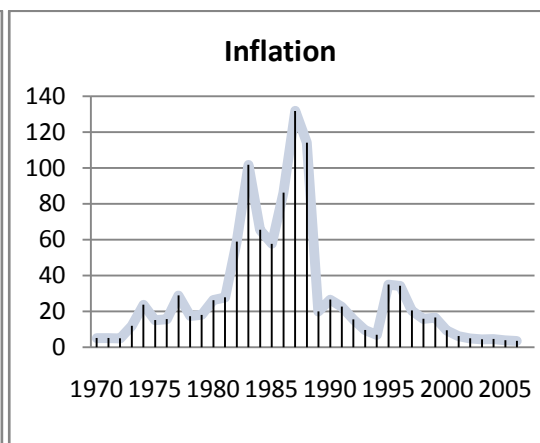


EXHIBIT 3.2



# CHILE INDICATORS

EXHIBIT 4.1

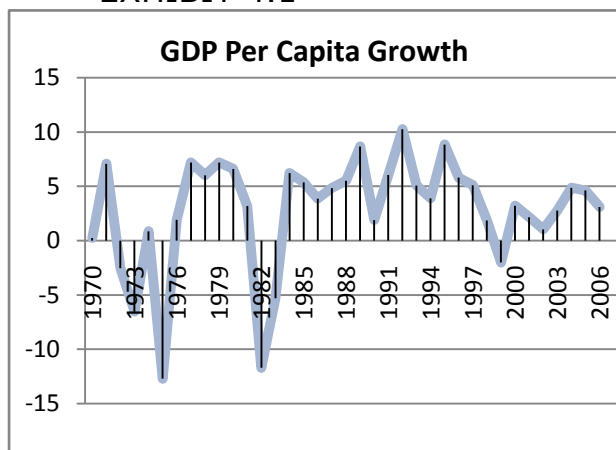


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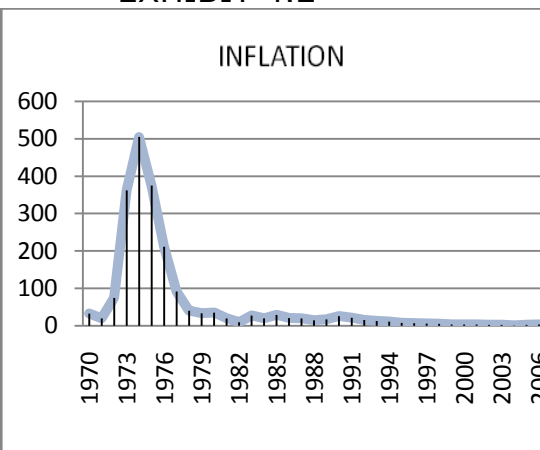


EXHIBIT 4.3





# VENEZUELA INDICATORS

EXHIBIT 5.1

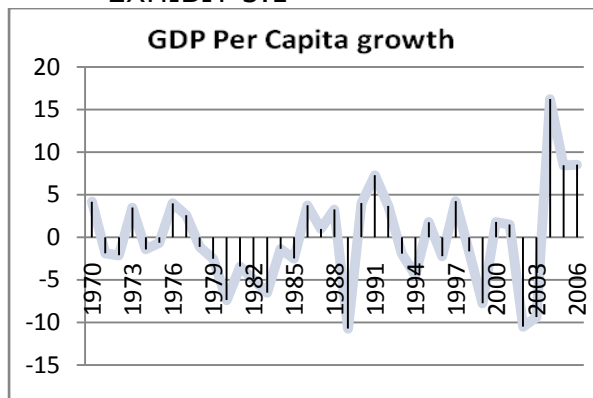


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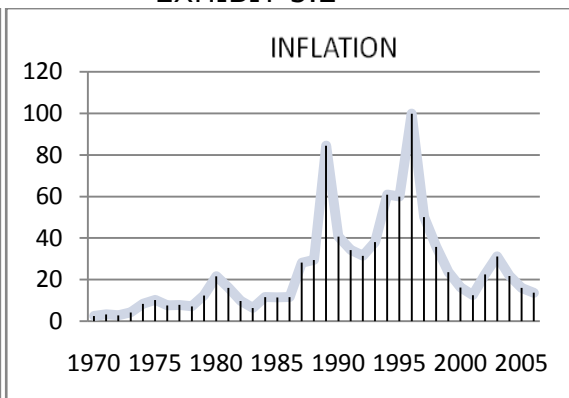
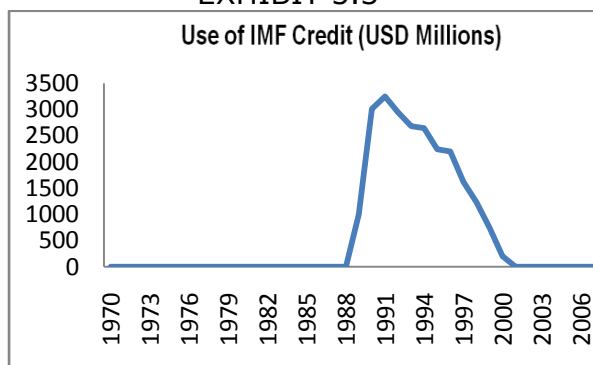


EXHIBIT 5.3



## COLUMBIA INDICATORS

EXHIBIT 6.1

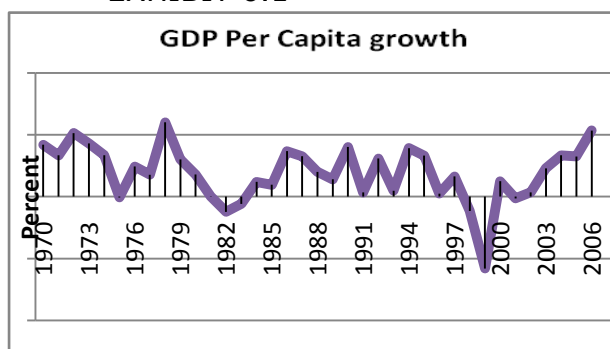


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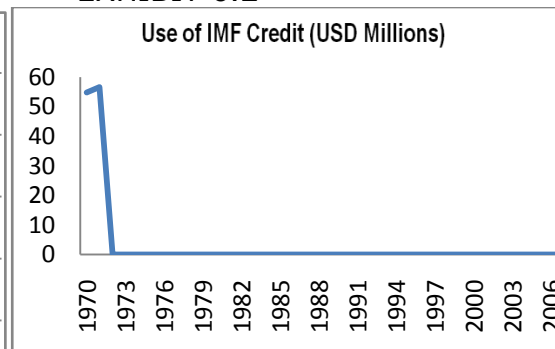
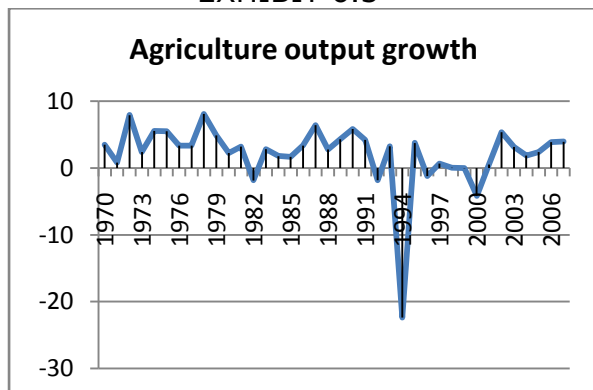


EXHIBIT 6.3



# SAUDI ARABIA INDICATORS

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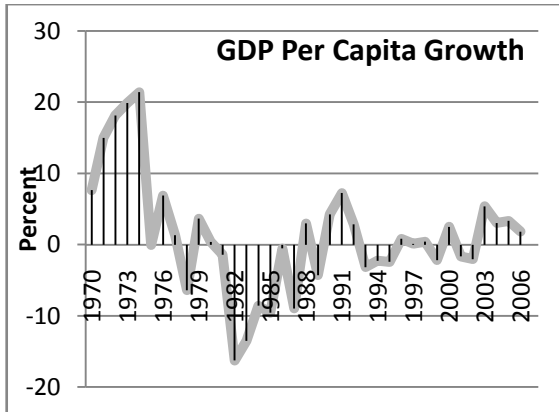


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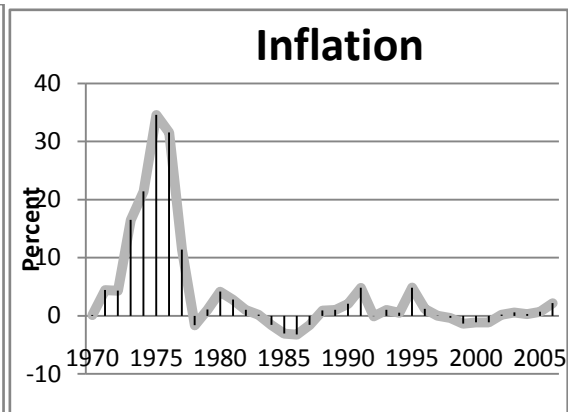
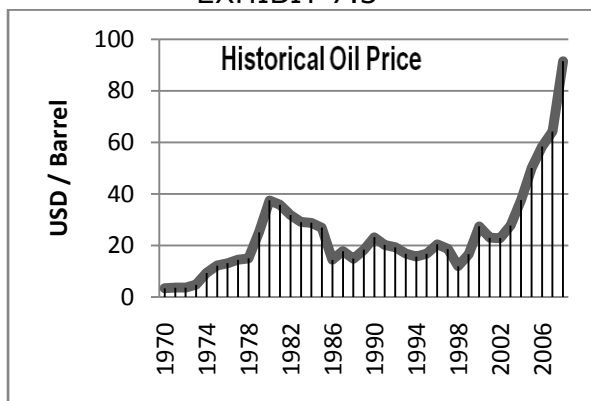


EXHIBIT 7.3



## EGYPT

EXHIBIT 8.1

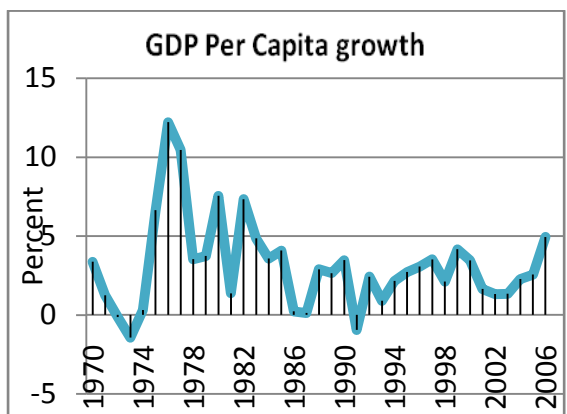


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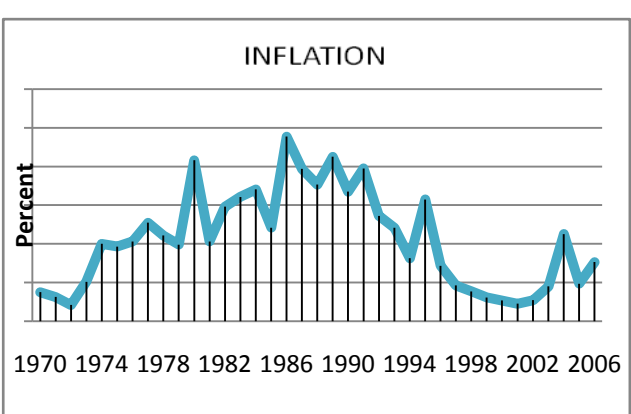


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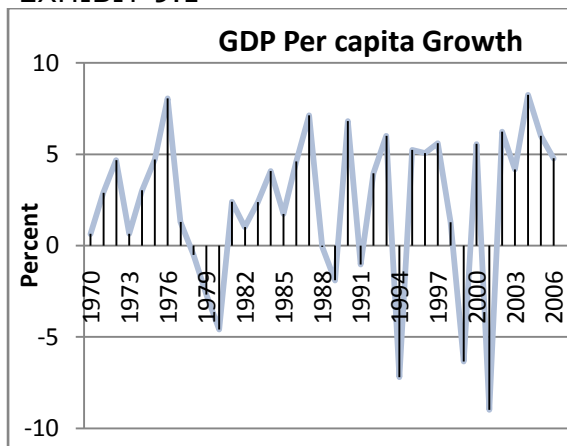


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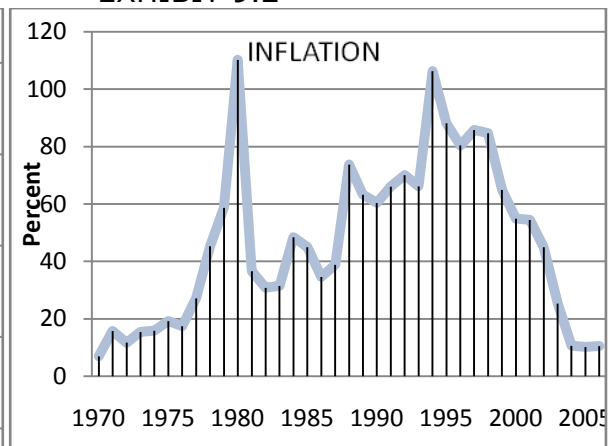


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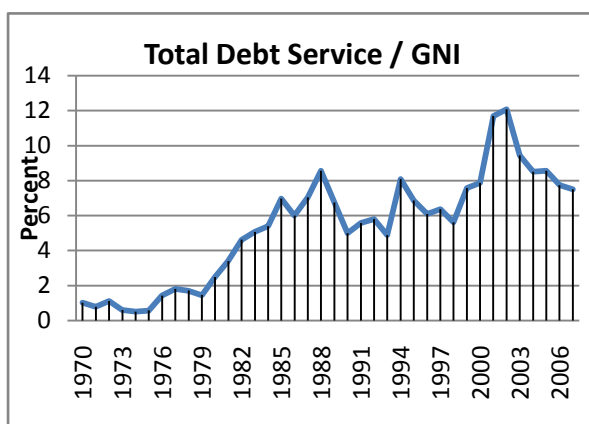


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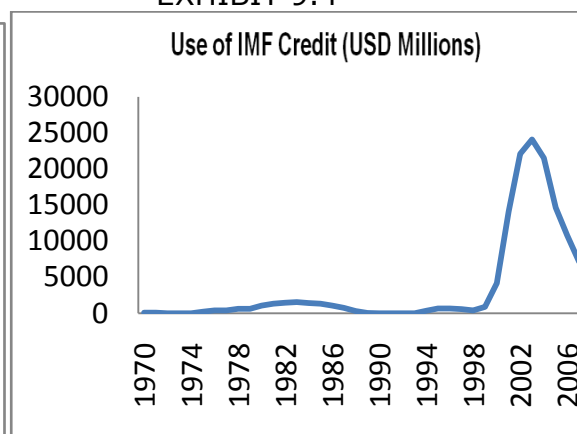
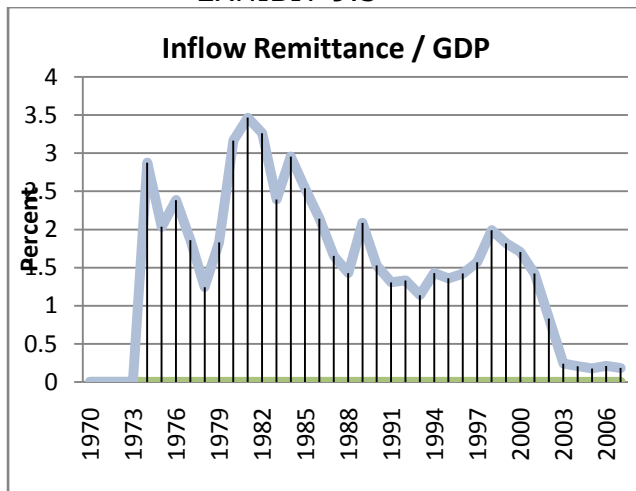


EXHIBIT 9.5



# ISRAEL INDICATORS

EXHIBIT10.1

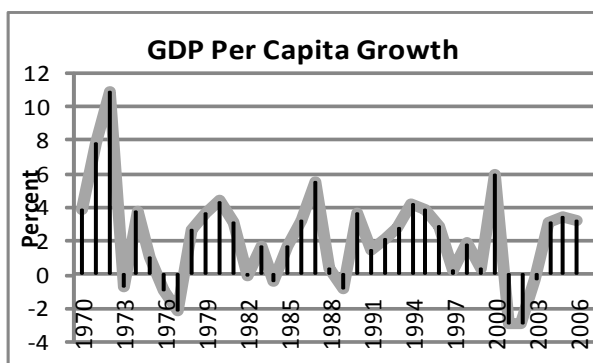
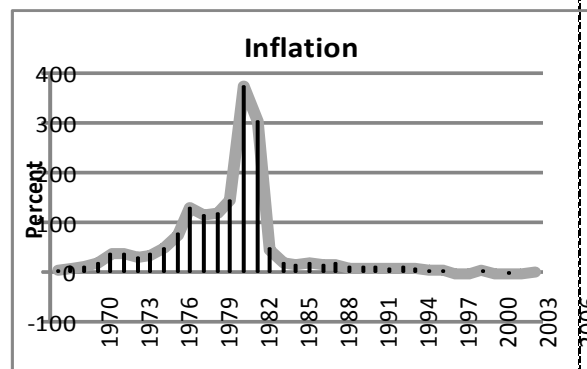


EXHIBIT 10.2



## MOROCCO

EXHIBIT 11.1

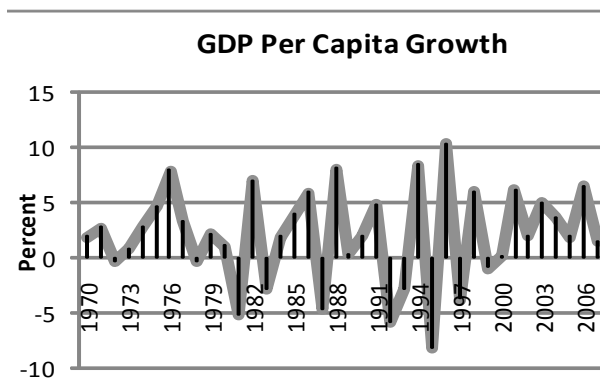


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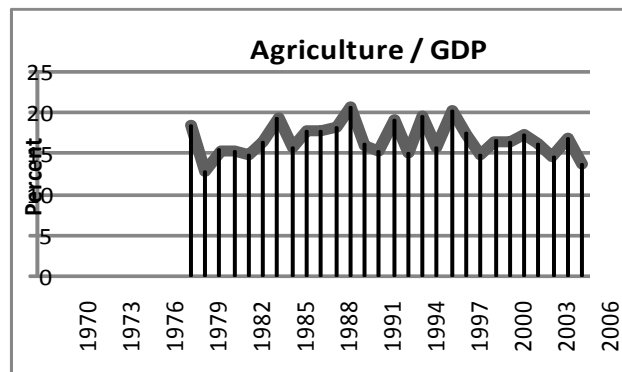


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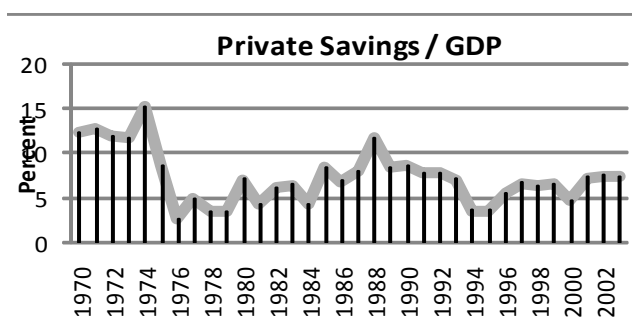
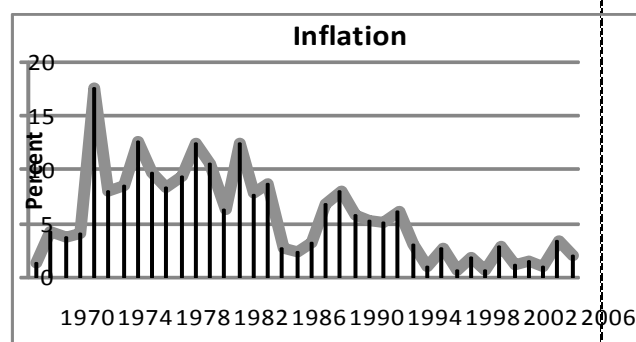


EXHIBIT 11.4



# TUNUSIA INDICATORS

EXHIBIT 12.1

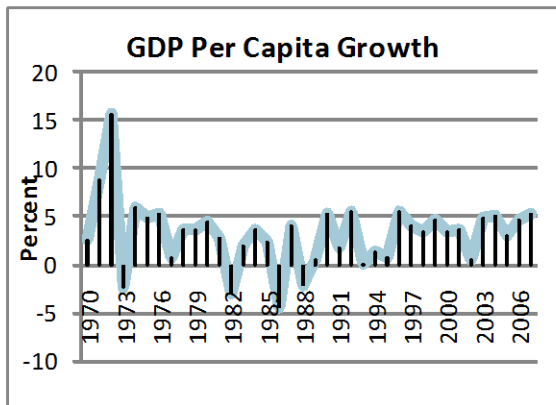
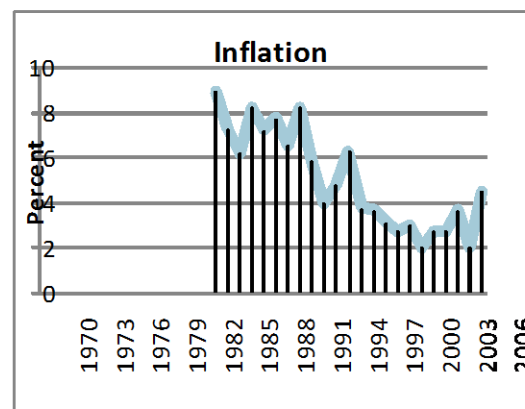


EXHIBIT 12.2



## SOUTH AFRICA

EXHIBIT 13.1

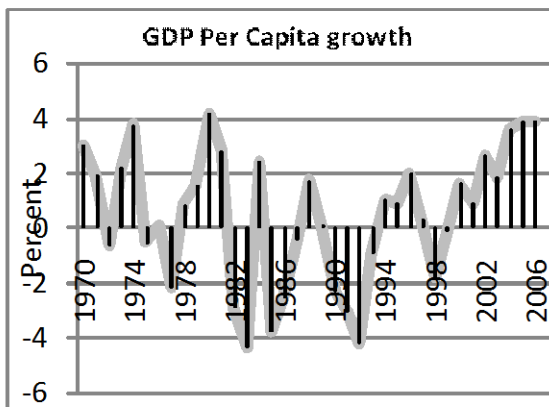


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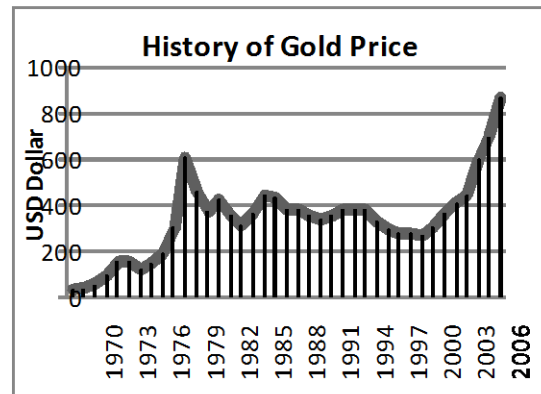
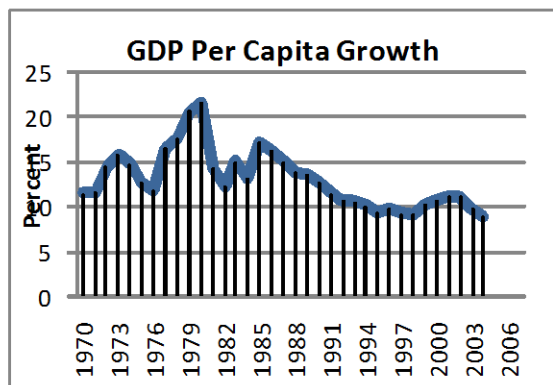


EXHIBIT 13.3



# INDIA INDICATORS

EXHIBIT 14.1

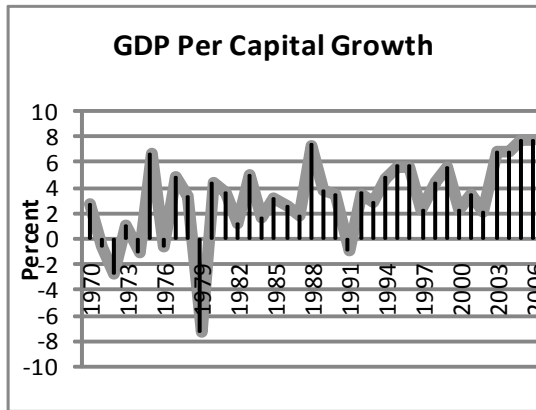


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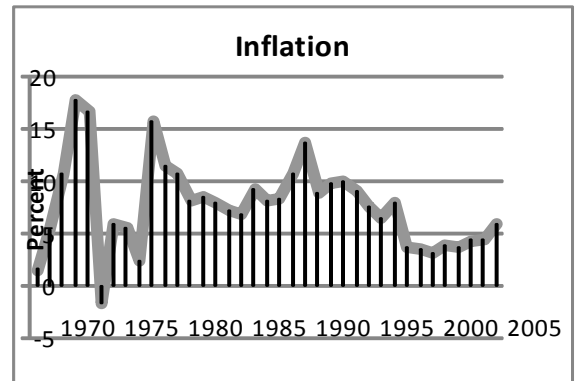


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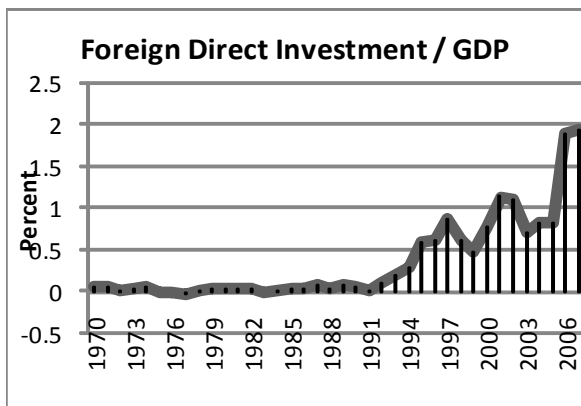


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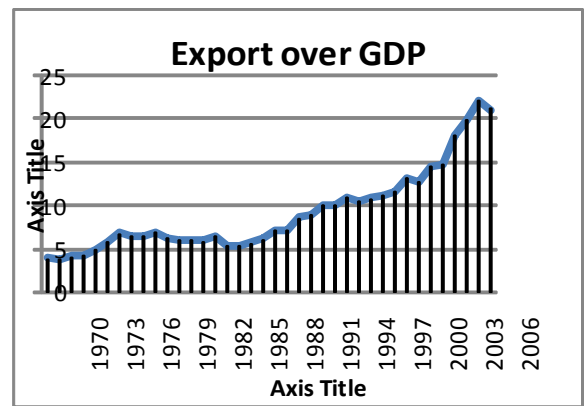


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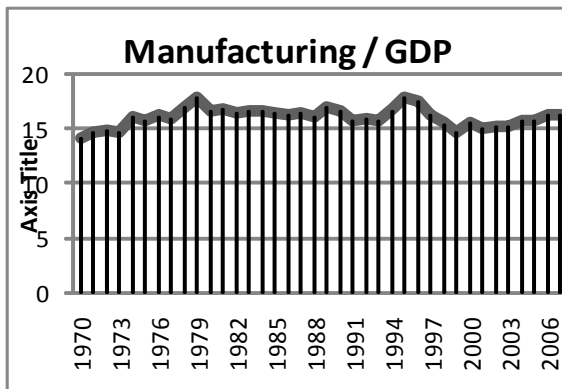
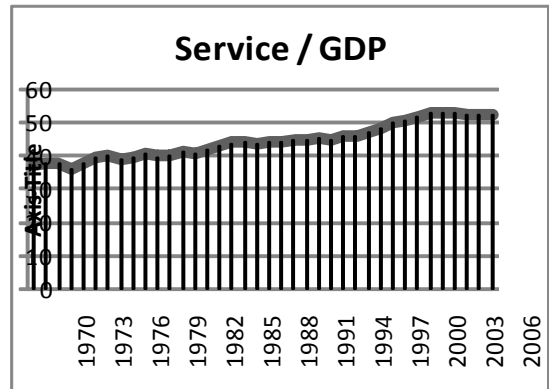


EXHIBIT 14.6



# SOUTH KOREA INDICATORS

EXHIBIT 15.1

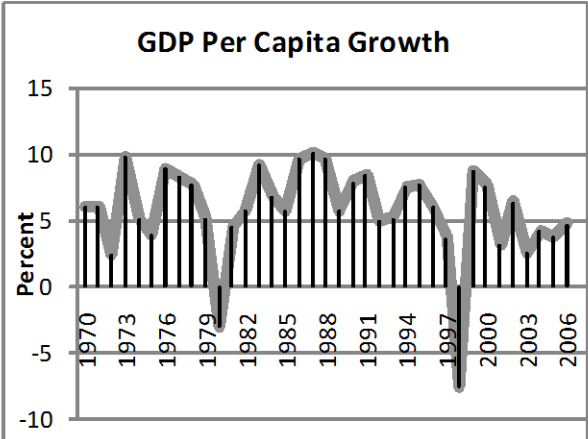
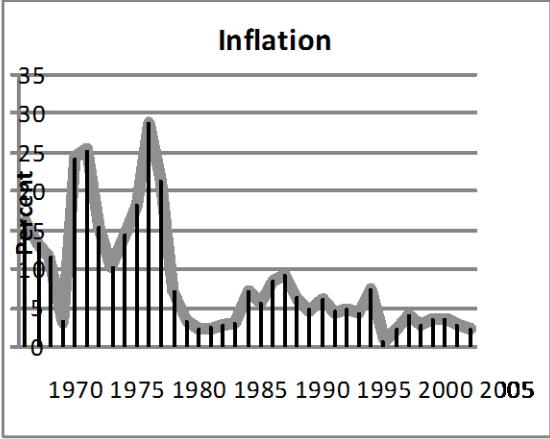


EXHIBIT 15.2



## PHILLIPPINES

EXHIBIT 16.1

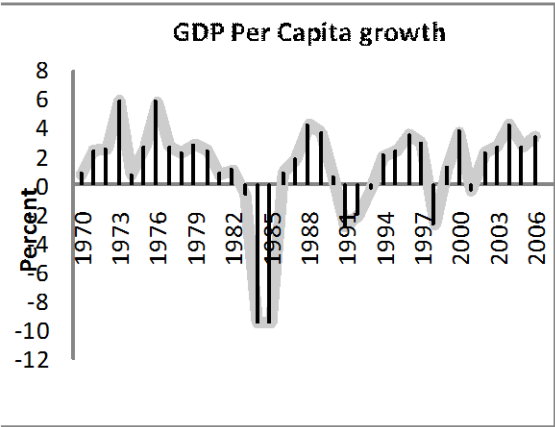


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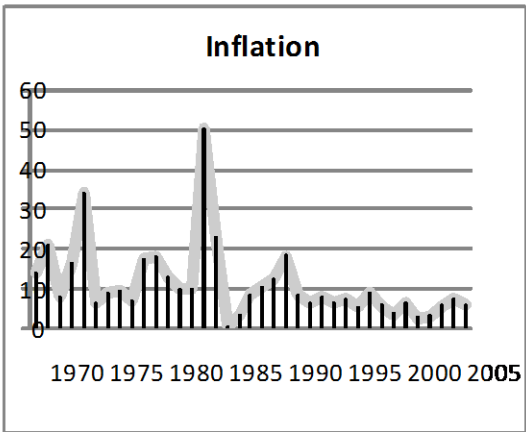
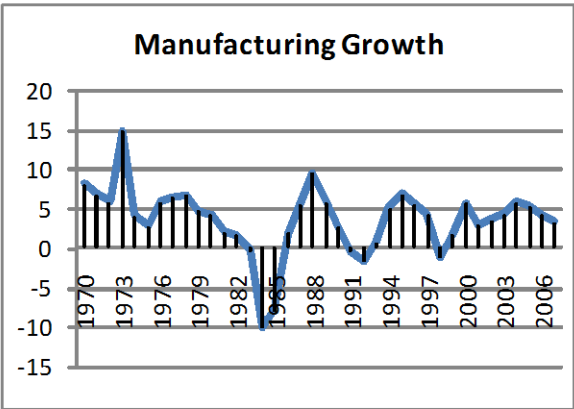


EXHIBIT 16.3



# INDONESIA INDICATORS

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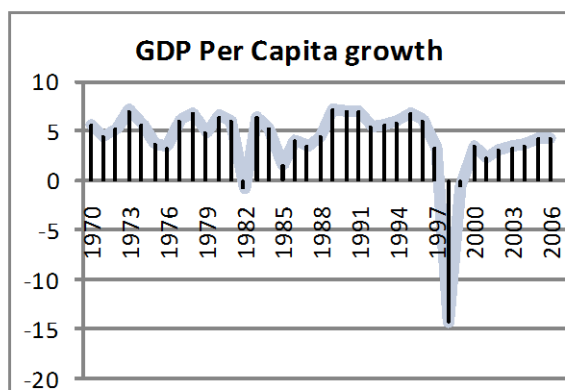


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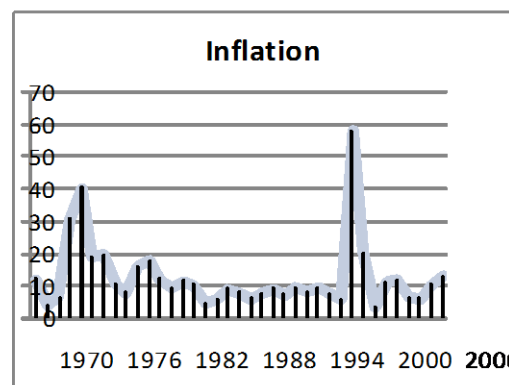


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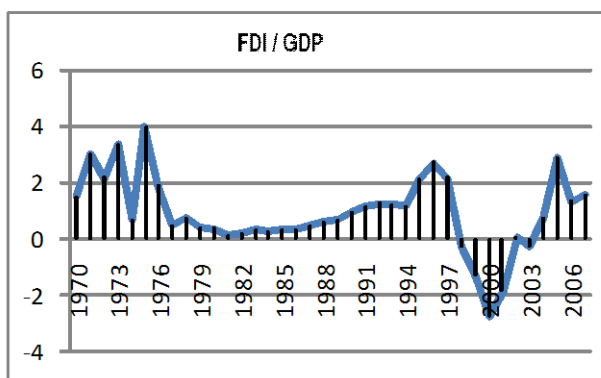


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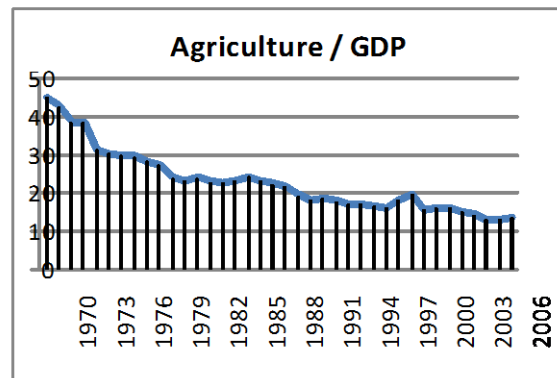


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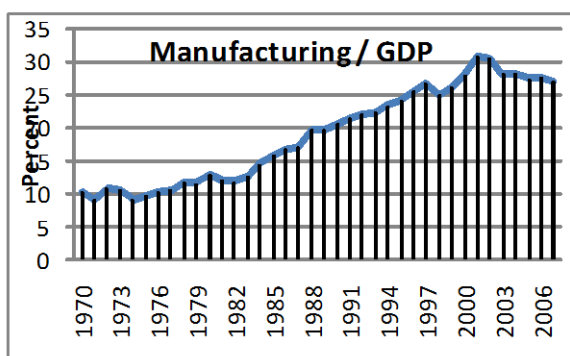
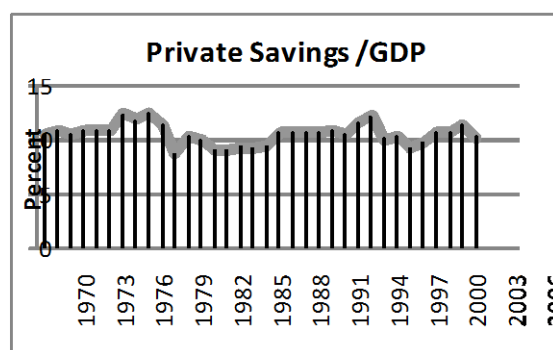


EXHIBIT 17.6





# THAILAND INDICATORS

EXHIBIT 18.1

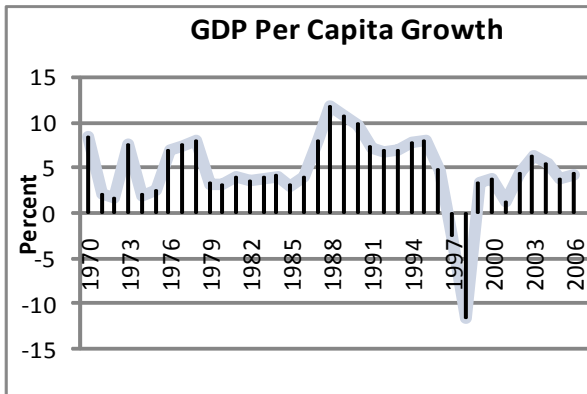


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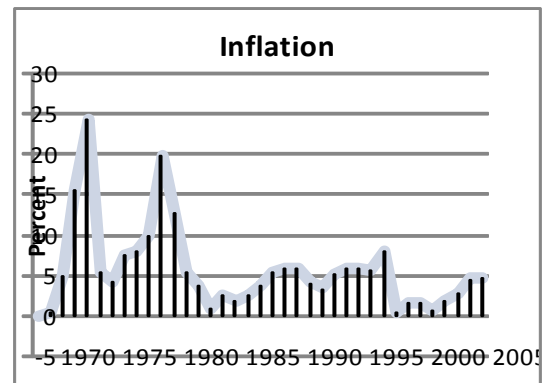


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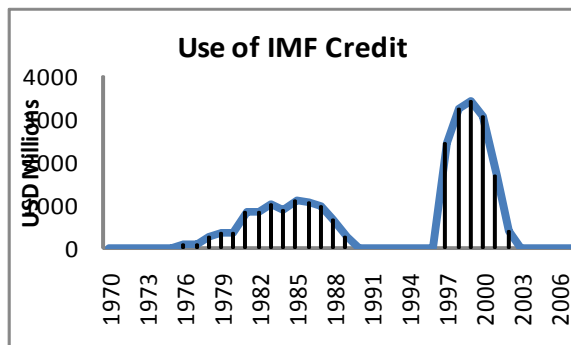


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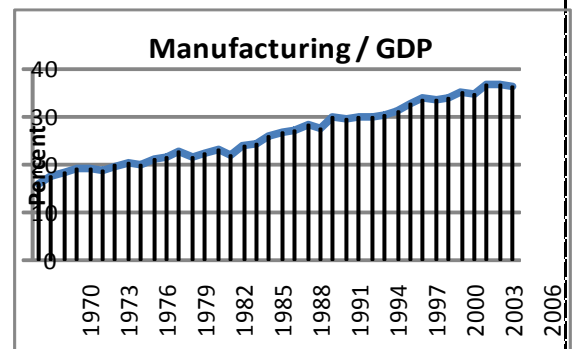


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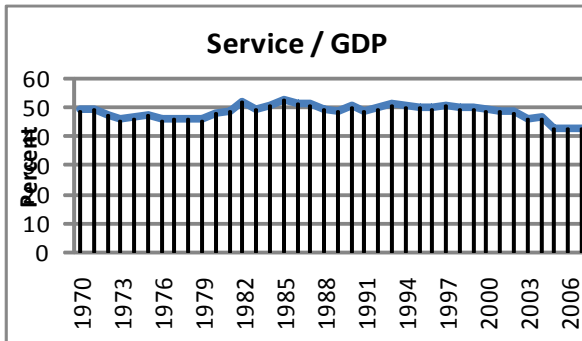


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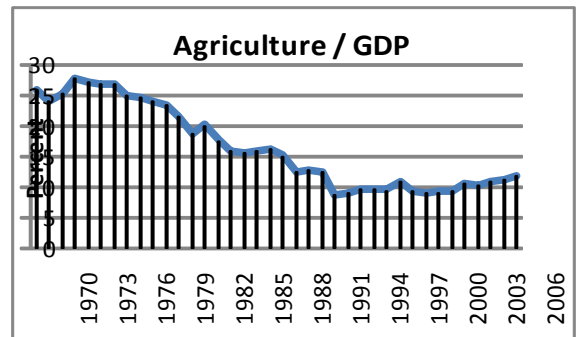
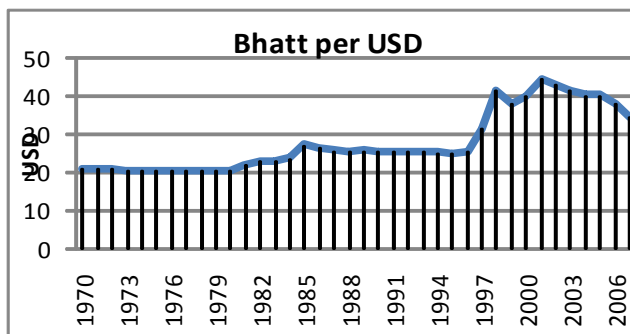


EXHIBIT 18.7



# MALAYSIA INDICATORS

EXHIBIT 19.1

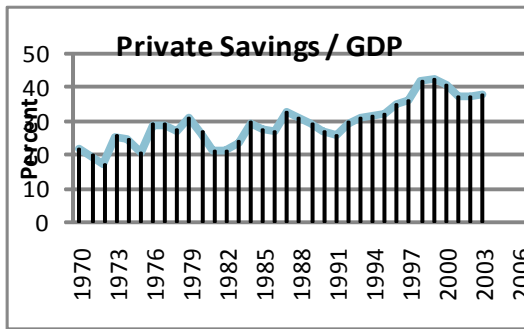


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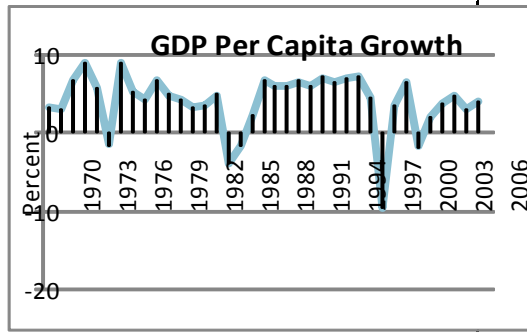


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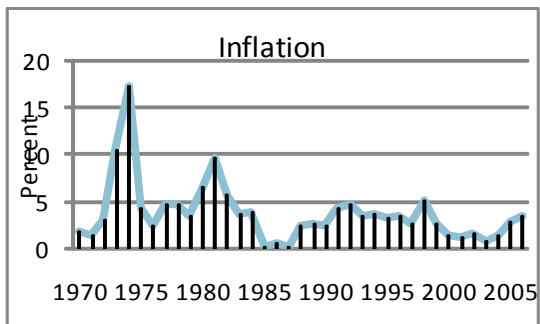


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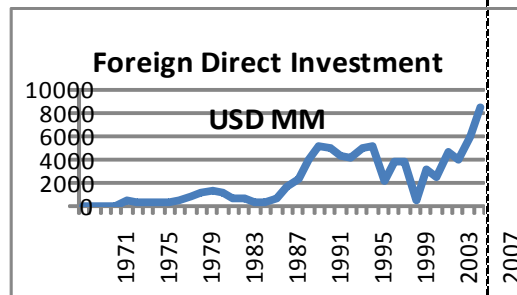


EXHIBIT 19.5

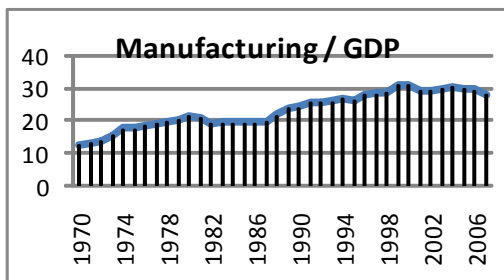


EXHIBIT 19.6

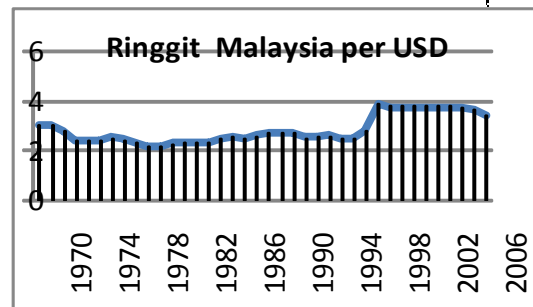
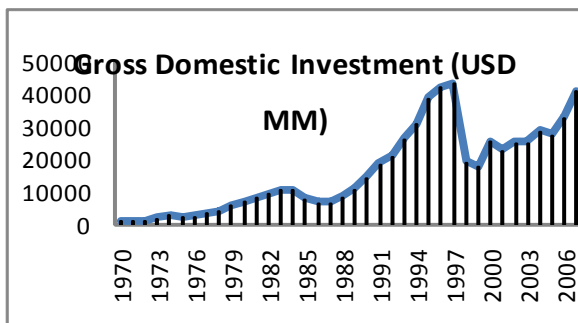


EXHIBIT 19.7



# SINGAPORE INDICATORS

EXHIBIT 20.1

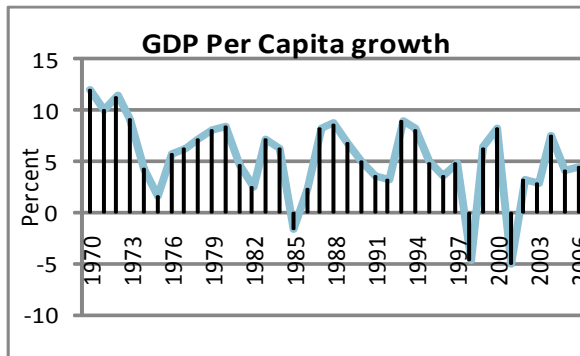


EXHIBIT 20.2

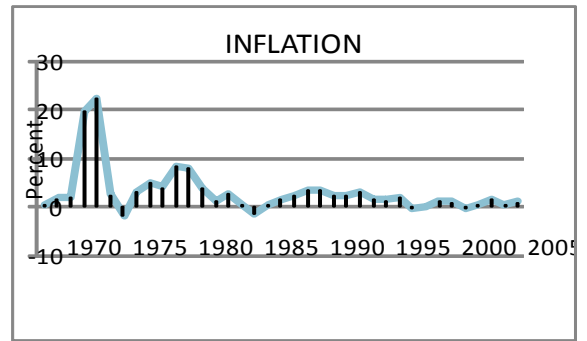


EXHIBIT 20.3

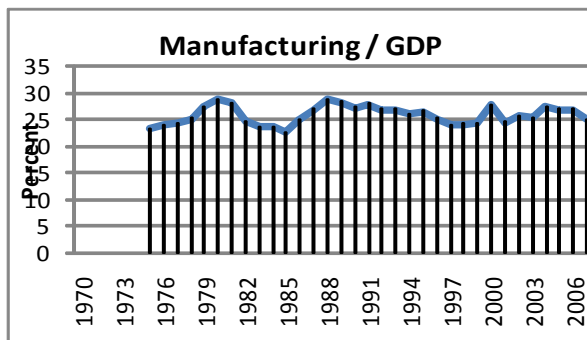


EXHIBIT 20.4

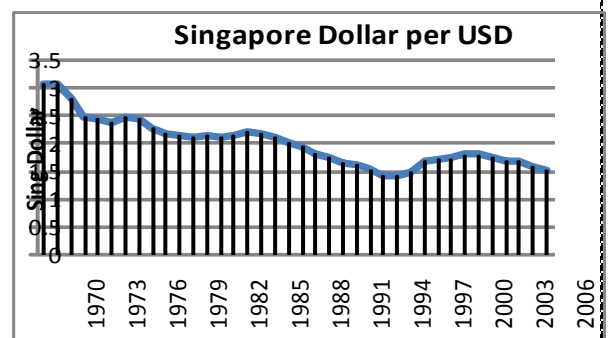


EXHIBIT 20.5

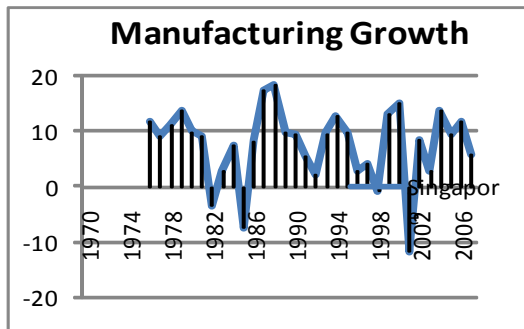


EXHIBIT 20.6

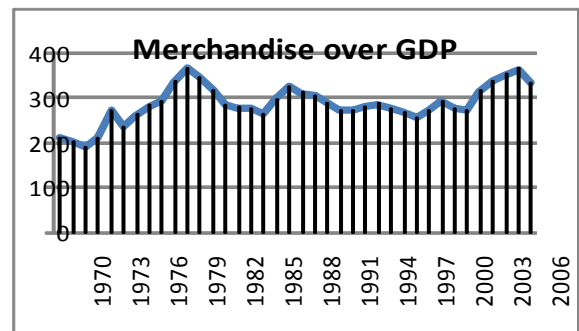


EXHIBIT 20.7

